

HUMAN RESOURCE MANAGEMENT WITHIN SMALL AND MEDIUM-SIZED ENTERPRISES

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HUMAN RESOURCE MANAGEMENT WITHIN SMALL AND MEDIUM-SIZED ENTERPRISES

Human resource management in het midden- en kleinbedrijf

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Chapter 1: Introduction

The importance of human resources has received much attention in recent years. At a macro level, endogenous growth theories suggest that the accumulation of human capital constitutes the main engine of macro-economic growth (Lucas, 1988, 1993; Romer, 1987, 1996; Mankiw et al., 1992). At a micro level, resource-based theory points to the human capital of employees as a major source for sustained competitive advantage for individual firms (Ferligoj et al., 1997; Koch and McGrath, 1996; Wright et al., 1994). Due to the increasing importance of human capital, which to a large extent is related to developments in information and communication technologies, current western economies are described as knowledge-based economies.

The increased importance of human capital is apparent at both the demand and the supply side of the labour market. However, an adequate supply of and demand for highly qualified labour is in itself not enough to guarantee economic progress; for each individual firm, supply of and demand for labour and human capital must be matched. Companies in the knowledge-based economy are challenged to meet their demand for highly trained employees in labour markets characterized by a shortage of qualified labour (Audretsch and Thurik, 2000, 2001). Human resources are becoming more important, and therefore also the management of these resources.

At the same time, the knowledge-based economy is characterized by an increasing share of small and medium-sized enterprises or SMEs (Audretsch and Thurik, 2000; Audretsch et al., 2002). Generally speaking, small firms pay less attention to human resource management or HRM than their larger counterparts do (Barron et al., 1987; Hornsby and Kuratko, 1990). Thus, while on the one hand the rise of the knowledge-based economy increases the importance of human resource management, the increase of the SME sector, which employees roughly half of all employees, is associated with a decrease of HRM practices.

Does the combination of these developments pose a threat to the success of knowledge-based economies? Our current understanding of HRM practices within SMEs is as yet insufficient to provide an answer to this question. As Heneman et al. (2000) conclude after a literature review of more than 400 articles, the available literature “appears to be rich in prescriptions, limited in sound descriptive surveys, and sparse in analytical research”. Especially quantitative studies, in which hypotheses on HRM within small firms are specified and tested empirically, are lacking (Heneman et al., 2000, page 15).

The aim of this PhD thesis is to increase our understanding of HRM practices within SMEs. On the one hand, we shall investigate determinants of HRM practices. Small and medium-sized firms differ from each other in their application of HRM practices, and we shall examine how these differences may be explained by various organizational characteristics. This is examined both for HRM practices in general, and for a specific field of HRM practices (precautionary actions to reduce absenteeism). On the other hand, the impact of HRM practices will be considered. Again, both the impact of HRM practices in general and the impact of specific HRM practices (firm-provided training) is examined.

To this end, five studies are presented in this thesis, which share a similar approach and methodology. First of all, they all focus on HRM practices rather than policies. Next, they assume bounded rational behaviour by the manager or business owner. The concept of bounded rationality is an important aspect of transaction cost theory, which plays an important role in three of the five studies. Finally, the studies have a quantitative orientation in common. In the first four studies, hypotheses are derived that specify relationships between explanatory variables and dependent variables. These hypotheses are tested using available data. The fifth study is based on a simulation model on labour flows within individual firms. The model has been calibrated using empirical information, and simulation results resemble empirically observed labour flows. This simulation model combines elements from various theoretical perspectives, and includes several HRM practices. In an indirect way, these HRM practices are part of the explanatory variables that explain firm size, which is the dependent variable in this study.

The next chapter presents an overview of the current knowledge on HRM within SMEs. The chapter starts with a literature review on the fields of HRM and SMEs, which is subsequently used to derive the theoretical framework, objective and research questions for this thesis. This is followed by the main results from the studies that have been performed. Consequently, chapter two is a combination of an introduction into and a summary of this thesis (a summary chapter is therefore not included, except for the summary in Dutch). Chapters three to five present the results of the underlying studies on determinants of HRM practices, while chapters six and seven contain two studies on the impact of HRM practices.

Chapters three to seven are presented in such a way that they can be read independently of each other. Thus, readers who are specifically interested in one of these studies can directly turn their attention to the chapter of their interest (although it is recommended to read the literature review included in chapter two first). These studies have also been published separately: chapters three to seven are based on De Kok and Uhlaner (2001), De Kok et al. (2003), De Kok (2001), De Kok (2002) and Den Butter et al. (2001).

Chapter 2: Managing personnel within small firms

2.1 Introduction

The recognition of the importance of human capital has led to an increasing flow of research on the management of human resources. At the same time, the increased awareness of the pivotal role of SMEs in modern economies is accompanied by a rich flow of scientific research on entrepreneurship and small business economics. The overlap between these strands of research is, however, limited, as is our current understanding of HRM practices within SMEs.

The first sections of this chapter contain an introduction into human resource management and in specific characteristics of SMEs, which is followed by a literature review on HRM within SMEs in section 2.4¹. Next, the objective and research questions of this thesis are presented in section 2.5, within the framework of a general research agenda for research on HRM within SMEs. The research questions relate to either determinants of HRM practices or their impact within small and medium-sized enterprises.

The main findings are discussed in sections 2.6 (on determinants of HRM practices) and 2.7 (on the impact of HRM practices). In the final two sections, we present some general conclusions and discuss how our findings relate to the main body of knowledge on HRM within SMEs.

2.2 Human resource management

2.2.1 Demarcation

Human resource management is about the management of an organisation's workforce. Managing a workforce first of all requires the presence of a workforce, which calls for activities in the fields of recruitment, selection, appraisal and compensation. Next, the workforce must be organised: tasks and responsibilities must be determined and communicated. To ensure that employees possess required knowledge and skills, training and development activities can be carried out. Such activities may influence the working climate within the organisation, and thus employee commitment and job satisfaction. Organisations may also employ activities that directly aim to improve commitment and satisfaction, either because job satisfaction is a goal in itself, or because it is believed to have a positive impact on organisational performance.

These activities may demarcate the scope of HRM, but they do not define it. Studies on HRM apply different normative models of what HRM should look like. In addition, HRM studies differ in their objective and theoretical perspective. This section provides

¹ Various parts of sections 2.2, 2.3 and 2.4 have been published in De Kok and Uhlaner (2001) and De Kok et al. (2003).

a brief introduction into these differences, and ends with the objective and perspectives used in the current thesis².

Personnel management and HRM

Research on personnel management dates back to the early decades of the twentieth century (Scott, 1915). Between mid-century and the late 1970's, research primarily focused on the development of valid and fair personnel management practices in large organizations. These studies examine the relationship between various practices and individual performance (Asher, 1972; Campbell et al., 1970; Ghiselli, 1966; Guion, 1965) and the sources of discrimination bias in hiring and promotion (Cann et al., 1981; Tenbrunsel et al., 1996).

The early 1980's witnessed a shift from personnel management to human resource management (Boselie, 2002; Legge, 1995). The introduction of human resource management started a period of conceptualisation, dominated by questions such as "what is human resource management?" and "what is the difference between human resource management and personnel management?" (Boselie, 2002). An extensive comparison between HRM and personnel management is provided by Legge (1995). Rather than providing formal definitions of HRM and personnel management, she presents normative models that reflect aspirations of what HRM / personnel management ideally should look like. Comparing normative models on HRM and personnel management, she concludes that HRM and personnel management have much in common, since they both:

- stress the importance of integrating personnel / HRM practices with organisational goals;
- identify assigning the right people to the right jobs as an important means of integrating personnel / HRM practice with organisational goals;
- emphasise the importance of individuals developing their abilities for their own personal satisfaction to make their best contribution to organisational success;
- vest personnel / HRM firmly in line management.

Differences between normative models of HRM and personnel management "are more those of meaning and emphasis than of substance" (Legge, 1995, page 74). The real difference between HRM and personnel management may be identified as "not what it is, but who is saying it" (Legge, 1995, page 75). Another distinction between HRM and personnel management is their appreciation of the role of employees. Where personnel management generally assumes that "employees are important to improve performance", many studies on HRM hold that "employees are the key to organisational success" (Boselie, 2002, page 13).

On closer examination of the normative models on HRM, two different groups can be distinguished, commonly known as the Harvard approach and the Michigan approach (Boselie, 2002; Legge, 1995). The Harvard approach, or "soft" version of HRM, stresses the human aspect of human resources. According to this approach, the com-

² More elaborate discussions on definitions and demarcations of HRM can be found in Boselie (2002), Guest (1997), Legge (1995), Paauwe and Richardson (1997), Sisson (1994), Storey (1992), and specialised journals such as International Journal of Human Resource Management and Academy of Management Journal.

mitment of employees offers an important source of competitive advantages, and HRM should therefore stress the development of employee commitment. This approach generally takes the point of view of various stakeholders into consideration, including shareholders, employees and trade unions. The Michigan approach, or “hard” version of HRM, stresses the resource aspect of human resources. According to this approach, HRM should strive for an internal fit of HRM practices and an external fit between HRM practices and business strategy. This strategic perspective of HRM has also been labelled strategic human resource management or SHRM (Delery and Doty, 1996; Snell, 1992). The viewpoint of this approach is mostly limited to that of the shareholders.

The co-existence of different normative models allows the HRM label to be applied to different approaches to the management of human resources, which adds to the problematic nature of the concept of HRM itself (Storey, 1998) and contradictions between various HRM models (Legge, 1995).

During the last decade, the focus of HRM research has shifted from conceptual studies about the nature of HRM to studies that examine the impact of HRM on organizational performance (Boselie, 2002; Guest, 1997). Often cited examples of this shift include Delery and Doty (1996), Huselid (1995), Huselid et al. (1997), Ichniowski et al. (1997), Koch and McGrath (1996) and MacDuffie (1995). These studies focus on specific (combinations of) HRM practices that are believed to improve organisational performance by improving competences and commitment of employees. These practices are usually referred to as high performance or high commitment HRM practices, and include practices such as testing of applicants, incentive pay systems, increased emphasis on workforce training and employee participation, and increased employment security.

High performance practices are sometimes referred to as sophisticated practices (Golhar and Deshpande, 1997; Hornsby and Kuratko, 1990; Goss et al., 1994), innovative practices (MacDuffie, 1995) or formal practices (Heneman and Berkley, 1999). Especially the latter label reflects that these practices are often relatively standardized and formalized. However, standardization and formalization are not necessary conditions. Little consensus exists regarding a more specific demarcation of high performance HRM practices (Guest, 1997).

Objectives

HRM studies not only differ in the underlying normative models, but also in the objective of their study. Three categories of general-level theories on HRM can be distinguished (Guest, 1997; Storey, 1992; Verbarg et al., 1997):

- normative or prescriptive studies; these studies reflect the view “either that a sufficient body of knowledge exists to provide a basis for prescribed best practice or that a set of values indicates best practice” (Guest, 1997, page 265);
- descriptive studies; these set out to describe the field in a comprehensive way;
- conceptual or strategic studies; these studies focus on the relationship between HRM policy and practice and other variables. HRM policy and practices can be treated as dependent variables when trying to explain observed HRM patterns. Another option is to treat HRM policy and practices as independent variables, and examine the impact of HRM on organizational performance.

Theoretical perspectives

Finally, studies on the management of human resources can be distinguished from each other by their theoretical perspective. Normative or descriptive studies can be performed without a specific theoretical background (Guest, 1997; Storey, 1992), but especially conceptual or strategic studies require a sound theoretical foundation. Two main theoretical perspectives of HRM literature are the resource-based perspective and the behavioural perspective (Delery and Doty, 1996; Huselid, 1995; Koch and McGrath, 1996; Lado and Wilson, 1994; Paauwe, 1998; Snell, 1992). In addition, some authors pay attention to the role of institutions on the incidence of specific HRM practices (Huselid et al., 1997; Jackson et al., 1989; Paauwe, 1998).

Not all studies on the management of human resources are labelled as studies on HRM or personnel management. These labels refer to literature that is mainly grounded in theories on management and organizational behaviour. The management of human resources is also being studied from an economic perspective. This approach is known as personnel economics (Lazear, 1999).

Demarcation of this thesis

Within this study, we want to examine how (and why) small firms manage their employees. Our focus is, therefore, on HRM practices rather than HRM policies. We will not examine to which extent the applied practices qualify to a specific normative model of HRM. The studies included in the following chapters are conceptual, where chapters three to five focus on HRM practices as the dependent variable, and chapters six and seven on HRM practices as independent variables. These studies use elements from various theoretical perspectives.

In the remaining part of this introduction into HRM, we shall discuss the resource-based perspective, the behavioural perspective, personnel economics and the institutional perspective. This section ends with a discussion of studies that have combined elements from various perspectives.

2.2.2 Resource-based perspective

The resource-based theory is based on the assumption that differences in physical, organizational and human resources between firms cause a fundamental heterogeneity in their productive potential. Given this heterogeneity, the long-term competitiveness of a company depends upon the resources that not only differentiate it from its competitors, but are also durable and difficult to imitate and substitute (Hansen and Wernerfelt, 1989; Mahoney and Pandian, 1992; Barney, 1991; Prahalad and Hamel, 1990; Rangone, 1999).

Human resources are an important source to generate sustained competitive advantage: “human resource systems can contribute to sustained competitive advantage through facilitating the development of competencies that are firm-specific (...), and generate tacit organizational knowledge” (Lado and Wilson, 1994, page 699).

Maintaining a competitive advantage based on human resources requires a management of those human resources that ascertains that these resources stay competitive, difficult to imitate and to substitute. This leads to the hypothesis that “certain human resource

strategies - namely, the accurate projection of human capital needs, the identification of individuals best suited to meet organizational objectives, and the development of employees - are expected to be positively associated with superior workforce performance” (Koch and McGrath, 1996).

The resource-based approach stresses the need for a specific HRM strategy which seeks to achieve competitive advantage by increasing commitment and competence of the workforce. This would require a set of internally consistent HRM practices, or, in other words, an internal fit of HRM practices. Obtaining internal fit is often associated with a best-practice approach to HRM practices (Huselid, 1995; Legge, 1995). The “best-practices” or “high-commitment” theory of HRM suggests that universally, certain HRM practices are associated with improved organizational performance. For instance, well-paid, well-motivated workers, working in an atmosphere of mutuality and trust, should generate higher productivity gains and lower unit costs (Boxall, 1996; Lowe and Oliver, 1991; Pfeffer, 1994; Walton, 1991).

Nevertheless, best practices are not a necessary consequence of the resource-based approach. A specific HRM strategy is suggested, but the strategy discussed by Koch and McGrath (1996) can call for different HRM practices for different firms: different needs regarding individual employees may result in different hiring, selection, training and compensation practices. For example, employee development may include formal training programmes for some firms, while for other firms training on the job may be a more appropriate way to obtain the required skills.

Some authors assert that the source of sustained competitive advantage lies in the human resources themselves, and not in the practices used to attract, utilize or retain them (Ferligoj et al., 1997; Wright et al., 1994). By contrast, other scholars argue that HRM practices themselves can be viewed as organizational competencies, such as the ability to motivate employees, handle internal politics and so forth (Barney, 1991; Narasimha, 2000; Oinas and Van Gils, 2001; Paauwe, 1998). Using either interpretation, human resources are viewed as important contributors to the success of the firm.

2.2.3 Behavioural perspective

The behavioural perspective on HRM can be defined as the use of personnel practices as tools for shaping patterns of behaviour that help to achieve organizational goals and objectives (Naylor et al., 1980). Different goals and objectives require different strategies and behaviours, and, therefore, different HRM practices (Snell, 1992). This leads to a focus on an external fit, resulting in contingency theories on HRM (Huselid, 1995; Legge, 1995)³. Size, technology, ownership, sector and location are examples of contingency variables that have been included in previous studies (Delery and Doty, 1996).

Building on this perspective, Schuler and Jackson (1987) test the notion that each of Porter’s three generic strategies (Porter, 1985) fits a certain constellation of HRM practices. They posit that those businesses that select HRM policy and practices appropriate

³ Obtaining an external fit is also relevant for configurational theories. Like contingency theories, configurational theories assume that the usefulness of specific HRM practices will depend on the context in which they are applied. In contrast with contingency theories, however, configurational theories are usually based on typologies of ideal types of HRM systems, and are concerned with specific patterns of HRM practices (Delery and Doty, 1996).

to particular generic strategies will also experience higher work performance. Thus, they posit that companies pursuing a quality strategy should have explicit job descriptions and high employee participation. Those with a cost minimization strategy should use tight narrow policies and those pursuing an innovation strategy should reward longer-term goals and broad career paths. In a review of this research, Barney and Hesterley (1996) note that empirical support of the hypotheses laid out by the behavioural perspective is relatively weak.

Nevertheless, the argument of fitting strategy and HRM practices is compelling. Rather than look at generic strategies and HRM practices, a different group of researchers posit a link between growth-oriented strategies and greater emphasis on HRM development. For instance, Lengnick-Hall and Lengnick-Hall (1988) posit a reciprocal interdependence between a firm's business strategy and its HRM strategy. In their model, demand for skilled employees may be dictated by competitive strategy. In turn, organizational readiness (the availability of necessary human resources) may affect competitive strategy. They further argue that high corporate growth expectations coupled with organizational readiness can lead to expansion. On the other hand, low human resource readiness and low growth expectations may lead to redirection of strategy to more attainable goals. Thakur (1998) and Matthews and Scott (1995) find empirical support for the proposed linkage between a growth-oriented strategy and HRM strategies to improve human resource readiness.

In sum, although it is not clear that the generic strategies as defined by Porter require different sets of HRM practices, there may well be some correlation between aspects of strategy such as growth orientation and the HRM practices that evolve.

2.2.4 Personnel economics

Both the resource-based and the behavioural perspective on HRM are grounded in theories on management and organizational behaviour. In contrast, personnel economics is grounded in economic theory, and has been defined as “the use of economics to understand the internal workings of the firm” (Lazear, 1999, page 200). Personnel economics applies insights from other economic theories that deal with human capital and the relationship between employer and employee, such as human capital theory, contract theory and principal/agent theory.

The basic building block of personnel economics is constrained maximisation: both employers and employees are assumed to be rational maximising agents, who want to maximise their profits and utility⁴ (where utility depends positively on wages and negatively on effort⁵). Given these assumptions, personnel economics focuses on explaining the behaviour of firms and employees, and how the interests of employer and employee can be aligned through financial incentives and proper contracts.

The attention for financial incentives has resulted in studies on the advantages and disadvantages of various compensation structures (e.g. input-based or output-based), pay compression (which occurs if wage differences are smaller than differences in produc-

⁴ Profit and utility functions include monetary equivalents of non-monetary rewards (Lazear, 2000, page 613).

⁵ The negative relationship between utility and effort is only assumed to exist at the margin.

tivity), work-life incentives and tournament theory. Although non-monetary aspects of work, such as teamwork and peer relationships, can also be examined within the personnel economics framework (Lazear, 1999, page 200), these aspects have not received much attention.

2.2.5 Institutional perspective

Institutional theorists view organizations as entities that gain legitimacy and stakeholder acceptance by conforming to their stakeholders' expectations (Huselid et al., 1997; Paauwe, 1998). Examples of stakeholders are governmental institutions, professional organizations and certifying bodies (Baron et al., 1988; Tolbert and Zucker, 1983). In many industrialized nations, government institutions frequently play a key role in defining expectations in HRM practices, such as recruiting, selection, performance measurement, training, and the administration of compensation and benefits (Paauwe, 1998).

Institutional theorists posit that the need to conform to the requirements or expectations of these outside groups may help to explain some of the variation in HRM practices (Jackson et al., 1989). For example, in a study of US firms, Jackson et al. (1989) find unionisation linked with more formal performance appraisal, higher compensation, more training for new hires, and a greater likelihood of bonuses given for company-wide productivity. In general, a variety of environmental influences are seen to restrict management's room for manoeuvre. Notably, in the Netherlands collective bargaining agreements and labour laws prescribe, prohibit, and influence the HRM practices and policies of organizations. Paauwe (1998) argued that between ten and twelve of Pfeffer's (1994) 16 "best practices" had been in place in almost every Dutch company from the 1970s because of legislation and the role of works councils and trade unions. Firm size also matters, since legislation is differentiated by size class.

2.2.6 Combining perspectives

HRM perspectives

At first sight, the suggestions from the resource-based and the behavioural perspective seem to be inconsistent with each other: where the resource-based perspective promotes an internal fit of HRM practices and provides a list of best practices (Pfeffer, 1994), the behavioural approach favours an external fit and a contingency approach, according to which different HRM strategies will be optimal for different firms. These two approaches, however, may not be inconsistent with each other, and could even reinforce each other: "all else being equal, the use of high-performance work practices and good internal fit should lead to positive outcomes for all types of firms. However, at the margin, firms that tailor their work practices to their particular strategic and environmental contingencies should be able to realize additional performance gains" (Huselid, 1995, page 644). Other examples of studies that combine these two perspectives are Delery and Doty (1996) and Lado and Wilson (1994).

Some researchers have attempted to further the understanding of HRM practices by combining other theoretical approaches to HRM. For instance, Lepak and Snell (1999) provide an interesting blend of theoretical frameworks to explain the heterogeneity of HRM practices, drawing from transaction cost economics, human capital theory and the resource-based approach. In their model, HRM practices converge on two dimensions: value and uniqueness of employee skills. Where required firm skills are valuable and

firm-specific, they suggest that the firm should pursue a strategy of internal development (including training and career development). Where skills are valuable but not firm-specific, the firm may pursue a strategy of acquisition, e.g., hiring a certified public accountant to work as the chief financial officer. On the other hand, where human resources are low in value, either simple outsourcing or an alliance with a partner with more unique resources may be in order.

Paauwe (1998) combines elements from the resource-based perspective, the behavioural approach and the institutional perspective. In his framework, firms are constrained by several factors when developing their HRM policies. These factors are grouped into three categories: factors concerning the nature of the product, market, and the technologies used, factors concerning the organisational configuration and administrative heritage, and social, cultural and legal factors. In addition, an organization's financial health may also constrain the decision-making margin. Within these constraints, the stakeholders of the firm determine the final choice of HRM policies. This choice depends not only on the constraints, but also on the values, expectations and goals of these stakeholders, as well as on financial resources. Together, differences in constraints and expectations can explain the heterogeneity of HRM practices (Paauwe, 1998).

The contingency factors in the framework by Paauwe (1998) closely resemble the organizational characteristics that are identified by Daft (1998). Daft (1998) distinguishes 13 different organizational dimensions. In order to understand and evaluate organizations, a thorough understanding of organizational characteristics belonging to each of these 13 dimensions would be required. These 13 dimensions can be grouped into two different categories: contextual and structural dimensions. Contextual dimensions characterize the organization as a whole, and include size, goals and strategy, environment, organizational culture and organizational technology. Structural dimensions pertain to internal characteristics of organizations, for example formalization, specialization, standardization and centralization⁶.

HRM perspectives and personnel economics

The behavioural perspective and personnel economics share some basic assumptions, for example that firms aim to maximise profits and determine (HRM) strategies accordingly, and that available human resource should be managed in a similar way as other resources. HR practices should aim to align the actions of employees with the interests of their employers (Snell, 1992).

Despite these similarities, a wide gap exists between HRM studies and personnel economics. There seem to be no studies that explicitly try to combine elements from these two strands of literature. Instead, attention focuses on three main differences⁷.

First of all, "Personnel economics is willing to express all compensation in terms of money, even if money is not the only or most important factor in compensation"

⁶ The other structural dimensions are hierarchy of authority, complexity, professionalism and personnel configuration.

⁷ These differences are based on Lazear (2000), who discusses "how economists differ from industrial psychologists and organisational behaviour scholars" (Lazear, 2000, page 613). It is interesting to note that Lazear (2000) doesn't use the label "HRM".

(Lazear, 2000, page 613). Generally speaking, HRM scholars do not seem to be willing to do the same.

Secondly, while HRM research more and more applies quantitative methods to test specific hypotheses, no such methods are used to derive these hypotheses. Personnel economics, on the other hand, mainly consists of formal model building from which hypotheses on employer and employee behaviour can be derived⁸. According to Lazear (2000), this may even be “personnel economics’ main selling point” (Lazear, 2000, page 612).

A third difference concerns the capacity of employers to determine the optimal strategy for their organization. Personnel economics assumes that employers behave as rational acting agents. The existence of imperfect information, transaction costs and “other intervening variables which make things somewhat more complicated” (Lazear, 2000, page 612) is acknowledged, but this doesn’t imply that the assumption of rational behaviour is no longer a valid starting-point for analysis. The capacity to determine the optimal strategy is assumed to be equally divided amongst all employers. In contrast, the resource-based perspective suggests the opposite: “the unique capabilities of the organization’s strategic leaders to articulate a strategic vision, communicate the vision throughout the organization, and empower organizational members to realize that vision” (Lado and Wilson, 1994, page 703) can constitute a competitive advantage that is difficult to imitate.

2.3 Small and medium-sized enterprises

The economics of small and medium-sized enterprises is a separate field of research. Two main arguments can be made, which together justify the specific attention for this subpopulation of private enterprises. The first is a quantitative argument: SMEs form a large and vital part of modern economies. The second argument is more qualitative: despite the heterogeneous character of the SME sector (Audretsch et al., 2002), SMEs differ from large enterprises in many respects. Put more formally, the contextual dimension “firm size” is related to the other dimensions of organizational characteristics. For example, firm size can influence the structural dimensions of organizations. If organizations become larger, the need to decentralize and communicate between employees and departments increases. This requires a certain level of standardization, specialization and formalization (Daft, 1988; Nooteboom, 1993). Also, smaller firms have less financial resources than larger firms have, and often have more difficulties in obtaining external financial resources (Fu et al., 2002).

This section presents an introduction into characteristics of small and medium-sized enterprises, which focuses on contextual differences between small and large firms⁹.

⁸ Empirical testing of these hypotheses has not yet received much attention, mainly due to the unavailability of suitable data. Since the second half of the 1990s, however, suitable data is becoming more and more available (Lazear, 1999).

⁹ More elaborate discussions on characteristics of SMEs can be found in Audretsch et al. (2002), European Commission (2000), Nooteboom (1993), Storey (1996), You (1995), and specialised journals such as the *International Small Business Journal*, *Journal of Small Business Management* and *Small Business Economics*.

2.3.1 Firm size

The population of small and medium-sized enterprises may be defined in various ways. Most definitions rely on statistical criteria. Turnover is sometimes used, but the most common criterion is the size of the workforce. This criterion will also be used in the current study. Boundaries that distinguish SMEs from large firms vary between 100 employees (Statistics Netherlands), 250 employees (Eurostat), and 500 employees (U.S. Small Business Administration). Within the group of SMEs, a more detailed classification into micro, small and medium-sized enterprises can be made. Again, the boundaries between these categories vary between (and within) countries¹⁰.

Within the European Union, SMEs account for 99.8% of all non-primary private enterprises (European Commission, 2000, page 45). In fact, the number of enterprises is dominated by the number of micro enterprises (defined as having 0-9 employees), which accounts for 93% of the total population. This picture of a very skewed distribution still arises if micro enterprises are excluded: within the group of enterprises with at least 10 employees, small and medium-sized enterprises (defined as having 10-49 and 50-249 employees, respectively) account for 97% of the total number of enterprises in this population.

For many purposes (especially within the fields of labour economics and human resource management), the relative importance of the SME sector can be better judged by looking at its share in total employment. Within Europe-19 (which represents all Member States of the European Economic Area and Switzerland), the employment share of SMEs (0-249 employees) is 66%. In the USA and Japan, the share of SMEs in total employment is less than half, but still accounts for a considerable part of total employment: in the USA, the employment share of SMEs is 42%, and within Japan it is 33%. Further details are provided in Table 2.1.

Table 2.1 Employment shares by size class in non-primary enterprises, Europe-19, USA and Japan, 1996

	SME				LSE
	Micro (0-9 empl.)	Small (10-49 empl.)	Medium-sized (50-249 empl.)	Total (0-249 empl.)	(≥ 250 empl.)
Europe-19	34%	19%	13%	66%	34%
USA	11%	19%	12%	42%	58%
Japan	n/a	n/a	n/a	33%	67%

Source: European Commission (2000), table 1.2, page 47.

2.3.2 Goals and strategy

Within micro-economic theory, labour is often treated as an input in the production function, and decisions regarding the optimal allocation of the production factors are made independent of the utility that employees derive from their work. The goal is usually considered to be profit maximisation. Traditionally, management literature assumes that large firms apply a rational and deliberate strategy formulation process as a means

¹⁰ In addition, boundaries may differ between industries, to take account of sectoral differences in scale effects: “a shop is sooner considered “big” than a factory” (Nooteboom, 1993, page 287).

to achieve this goal (Chandler, 1962; Legge, 1995). Methods like SWOT-analyses (an analysis of an enterprise's Strengths, Weaknesses, Opportunities and Threats) are used to analyse markets and organizations, resulting in formal written strategies.

Various arguments can be made why this approach is not fruitful for studying the decision-making process within small and medium-sized organizations. An important difference between small and large firms is the relationship between ownership and supply of labour. Whereas within large firms, ownership and labour supply are generally independent of each other, in small firms the owner usually has a dominant position within the firm and takes part in the actual production process. Nooteboom (1993, page 287) described the dominant role of the business owner or entrepreneur as follows: "The firm bears the personal stamp of the entrepreneur in many respects: on the primary goal of the firm (profit, growth, stability, job satisfaction); on orientation (technical, commercial, social); on style of internal and external communication, work conditions, etc. Some small-firm owners are motivated towards "true" Schumpeterian entrepreneurship, others towards maintaining established, traditional ways of doing things (craftsmanship), maintaining independence, staying small, having a quiet life. They can afford to entertain unorthodox objectives (unorthodox in the view of economic science) to the extent that they own the firm, which they often do".

Given organizational goals, small and large firms will differ in the strategies they (implicitly or explicitly) apply to reach those goals. The assumption of rational strategy formulation implies that employers will establish which information they require, obtain this information, correctly interpret it, and use it to arrive at an optimal strategy given the available information. However, strategy formulation may be more of an emergent process than a deliberate one (Mintzberg and Waters, 1985; Legge, 1995; Whittington, 1993). Employers' rationality is bounded: their knowledge of alternatives and consequences is prey to cognitive limitations, and they often suffer from a lack of motivation to conduct comprehensive information searches (Legge, 1995, page 100). Small firms have less experience and a more limited capacity for the acquisition of knowledge, which leads Nooteboom (1993) to conclude that small firms are more bounded in their rationality than large firms are.

An important source for this lack of experience and limited capacity is a lack in manpower and management time. Most employers are taken up by day-to-day worries, which follows from their participation in the production process (Van den Tillaart and Warmerdam, 1997). Also, small-firm employers often do not have a formal management education, and the possibilities to gain management skills by co-operating with other managing employees are limited. As a result, employers are often not able to use classical management tools properly (Lee, 1995). Finally, as a consequence of having relatively few employees, decisions regarding personnel management have to be made less often, causing small firms to have less experience and routine in HRM activities (Nooteboom, 1993; WRR, 1987).

If rationality is bounded, it becomes relevant to know where the limited attention of employers is directed at. For small firms, "the perspective from which external scanning is performed is often dominated, and thereby restricted, by the personal perspective of the entrepreneur" (Nooteboom, 1993, page 289). Bounded rationality thus points towards the importance of theories on entrepreneurship, to explain the heterogeneity in organizational strategies within SMEs.

Differences in goals and strategy will, in turn, affect other dimensions of organizational characteristics. For example, small-business owners who are oriented towards maintaining independence and keeping full control over their company may favour an informal and flexible organization. Formalizing procedures and agreements would not only reduce their flexibility, but also strengthen employees' rights, and thereby reduce the employers' control over his or her own company (Koch and Van Straten, 1997). Various studies on entrepreneurship support the finding that small organizations are more likely to operate in an informal and flexible manner (Chaston, 1997; Gibb, 1997; Hendrickson and Psarouthakis, 1998; Lee, 1995; Marlow and Patton, 1993; Pfeffer, 1994; Storey, 1994; Whittington, 1993). This would apply especially to family businesses (Blais and Toulouse, 1990; Bacon et al., 1996).

2.3.3 *Organizational culture*

The dimension of organizational culture represents the underlying set of key values, beliefs, understandings and norms shared by an organization's workforce. These underlying values relate to ethical behaviour, commitment to efficiency, or to colleagues, customers or other stakeholders. An organization's culture can be observed in its slogans, ceremonies, dress, and office layout (Daft, 1998).

Especially in small firms, the culture will be determined by the values and norms of the business owner(s). These values and norms may influence not only the goal of the enterprise, but also the strategy on how to obtain that goal (Kotey and Meredith, 1997). The organizational culture will not only be shaped by the owner's values, norms and goals, but also by the way in which these are communicated to the employees (Marlow and Patton, 1993)¹¹.

The dominant role of the business owner is not only due to the owners' personality and characteristics, but also due to the lack of other stakeholders in the decision-making processes. Often, the employer combines the roles of CEO, board of directors and HR staff. In addition, work councils, if present, have fewer rights than in large firms. Consequently, managers' internal room for manoeuvre is larger for smaller companies. This is illustrated by Simon (1996), who has examined over 500 successful small and medium-sized enterprises: "I frequently ask managers what percentage of their energy they waste fighting internal resistance. In large corporations, the answer usually lies between 50 and 80%, small to mid-size companies usually cite a range of 20 to 30%" (Simon, 1996, page 197).

2.3.4 *Environment*

Some authors argue that the main characteristic of SMEs, beside their size, is uncertainty. Uncertainty regarding internal activities and procedures is lower for small-firm employers, because it is easier to directly monitor the activities of most or all employees (Barron et al., 1987; Westhead and Storey, 1996). The external uncertainty is, however, higher for small firms. This is a direct result of their lack of power at various market places, for labour, capital, and output (Westhead and Storey, 1996). This raises the transaction costs of transactions with external parties (Nooteboom, 1993) and results in

¹¹ An introduction into the relationships between entrepreneurship and entrepreneurial, organizational and societal culture can be found in Audretsch et al. (2002).

a relatively short time horizon for small firms (Storey, 1994; Westhead and Storey, 1996).

Legislation may also differentiate between small and large firms, mostly by being less stringent for small firms. Often, public and non government organizations have more attention for the actions of large firms than for those of small firms. In this respect, the environment is paying less attention to smaller firms than to larger organizations. This may be beneficial for smaller firms, in that they are less restricted in their activities. However, this lack of attention can also result in a deficiency of information and services adjusted to the specific needs and requirements of small companies. For example, Westhead and Storey (1996) argue that many providers of training are focused on the requirements and needs of large firms, making their services less suitable for small firms.

2.3.5 Organizational technology

Differences in market power, organizational structure and production technologies result in diseconomies of scale for small firms. The impact of production technologies is however decreasing: recent developments in ICT technologies have reduced the minimum efficient scale of many production technologies, reducing the diseconomies of scale due to production technologies for SMEs (Audretsch and Thurik, 2000, 2001; Nooteboom, 1993).

2.4 HRM within SMEs

2.4.1 Previous research

Most studies on HRM within SMEs are based on qualitative studies, as Heneman et al. (2000) have recently documented in a literature review on this topic amongst 28 different publications. 403 articles on HRM were identified, of which 129 specifically addressed human resource topics in SMEs. Only 14 of these apply quantitative methods to analyse the available information¹². They conclude that “the lack of information about human resources in SMEs is problematic for theory, research and practice” (Heneman et al., 2000, page 11).

The available empirical information on HRM within SMEs suggests that smaller firms make less use of high performance HRM practices than larger organizations do (Barron et al., 1987; Hornsby and Kuratko, 1990). This is in line with the finding that small organizations are in general more likely to operate in an informal and flexible manner than larger firms are. For instance, Koch and McGrath (1996) find that, in general, firm size is positively related with the incidence of HRM planning and formal training, and with the level of overall HRM sophistication. Westhead and Storey (1997, 1999) find that both managers and employees are less likely to get formal training in a small firm. In a study by Jackson et al. (1989), smaller companies are found to have less formalized per-

¹² These articles have been published in only three different journals: Journal of Small Business Management (11 articles), Frontiers of Entrepreneurship Theory (2 articles) and Journal of Occupational and Organizational Psychology (1 article). Heneman et al. (2000) mention 17 empirical articles instead of 14, but three articles focus on self-employed people without personnel.

formance appraisals, less likelihood of bonuses based on company productivity and less training than do larger companies (with more than 1,000 employees). Aldrich and Langton (1997) find that larger companies have more formalized recruitment practices. Firm size is, however, not the only factor in predicting HRM practices: a large heterogeneity exists in the type and formalization of HRM practices found among smaller firms.

In attempts to explain these HRM patterns, some scholars argue that an informal approach is more suited to the small firm. For instance, Hill and Stewart (1999) suggest that smaller firms should be more flexible and informal to be able to cope with the higher levels of environmental uncertainty. By contrast, others argue that it is lack of foresight and/or resources that leads to less use of formal high performance HRM practices in small businesses. For instance, Hendry et al. (1991) conclude that owners of small companies view any training beyond the level necessary to perform their immediate jobs as a luxury to be provided only when the firm is making large profits. And Golhar and Deshpande (1997) argue that a lack of understanding of HRM issues by small business owners may be one of the explanations for firm-size differences in HRM practices.

In addition to being characterized as informal, small firms are often held to be less specialized than larger firms (Bacon et al., 1996; Jackson et al., 1989; Wagner, 1997). Employees in smaller firms often have to perform a greater variety of tasks than do employees in larger firms, and specialists are less likely to be found in smaller firms. Heneman and Berkley (1999) confirm this trend within the HRM function. In a random sample of 117 companies with less than 100 employees, they find that only 15 have an HRM department.

In spite of the above-mentioned studies, growing evidence, largely derived from case studies and small pilot studies, suggests that HRM practices can be more sophisticated than expected in the typical small firm (Arthur and Hendry, 1990; Bacon et al., 1996; Curran et al., 1993; Deshpande and Golhar, 1994; Hendry et al., 1991; Hornsby and Kuratko, 1990; Marlow and Patton, 1993). For example, Deshpande and Golhar (1994) find HRM practices within many small manufacturing firms to be as sophisticated as those in larger companies. Similarly, Hornsby and Kuratko (1990) find that while firms of all sizes use primarily informal recruitment and selection techniques (mainly employee referrals and the interview), that even among small firms, HRM practices are often more sophisticated than they had expected. Using a small set of cases, Hill and Stewart (1999) also demonstrate variation in level of sophistication of HRM practices among smaller organizations.

2.4.2 Main findings

Research on HRM within SMEs is still in an explorative stage. By and large, empirical studies are of a descriptive nature. A sound theoretical underpinning or perspective seems to be lacking, and the empirical part is generally limited to a presentation and discussion of the results of a questionnaire or a number of case studies. The practice of deriving and testing hypotheses has not yet become customary. In fact, Kotey and Meredith (1997) is the only identified example of this practice. Notwithstanding these limitations, some conclusions may be drawn.

Unique approaches to HRM within SMEs: well documented

The majority of empirical studies describes HRM practices that are applied by small and medium-sized enterprises. Some studies focus on a specific field of HRM¹³, but most studies include various aspects of HRM. We may conclude from these studies that smaller firms generally have less sophisticated HRM practices, but a substantial amount of unexplained variation still remains across small firms.

The general impression that research on HRM within SMEs is still in an explorative stage does not apply to all fields of HRM practices. Especially research into wage differentials between small and large firms has moved well beyond this stage¹⁴. On average, smaller firms pay lower wages to (observably equal) employees than larger firms do (Audretsch et al., 1999; Barron et al., 1987; Oosterbeek and Van Praag, 1995). Using data from the Netherlands, Oosterbeek and Van Praag (1995) find support for a screening view on hiring decisions to explain this finding. Large firms are assumed to have higher monitoring costs (due to the size of their labour force), which increases the benefits of screening for workers with high abilities. They conclude that “large firms are incapable of observing workers’ ability, but by offering a higher rate of return on schooling they succeed in attracting the most able workers” (Oosterbeek and Van Praag, 1995, page 181).

Various studies address the question whether the applied HRM practices are applied with a specific goal in mind and integrated with other (HRM) practices, or whether they are the result of legal obligations and ad hoc decisions. In other words, to which extent does the way in which these firms manage their workforce satisfy normative HRM models. The general notion seems to be that way in which SMEs manage their employees resembles the “bleak house” concept, where employment relations can be “typified by direct management control, poor terms and conditions, high staff turnover and little training” (Bacon et al., 1996, page 82). The finding that smaller firms, in general, pay lower wages and provide less training than larger firms do (Black et al., 1999; Barron et al., 1987; Patton et al., 2000) seems to support this notion. In addition, it is argued that “individual HRM changes in most organizations do not add up to a consistent integrated package deriving from a long-term coherent management strategy” (Duberley and Walley, 1995, page 905).

Nevertheless, various authors claim that this general notion is incorrect, or at least doesn’t apply to a large group of SMEs (Hill and Stewart, 1999; Hornsby and Kuratko, 1990). Small and medium-sized enterprises may even have a behavioural advantage over large firms when it comes to managing employment relationships: “The lack of formal or professional policy towards employee management enables flexibility within the labour process, and an individual approach to the employment relationship. This is further facilitated by the lack of collective employee representation which owners and managers consider unnecessary, because of the quality of the employment relationship which has a classic unitarist framework. Paradoxically, however, the very lack of formal

¹³ Heneman and Berkley (1999) focus on recruitment and selection practices, while Hill and Stewart (1999) and Goss et al. (1994) limit their attention towards training.

¹⁴ It is interesting to note that this stylised fact has been studied within the field of labour economics, but seems to be ignored in the literature on HRM within SMEs.

implementation raises a debate as to whether these practices are indeed HRM as they lack strategic foresight.”(Marlow and Patton , 1993, page 63).

Determinants of HRM practices: relevance of contextual and structural dimensions has received less attention

How may we explain differences in HRM practices that exist between small and medium-sized enterprises? The relevance of contextual and structural dimensions (other than firm size itself) has been examined in a limited number of studies. For example, Duberley and Walley (1995) discuss the relevance of firm age, presence of an HRM department, business ownership, level of unionisation and strategy. Kotey and Meredith (1997) include goals and values of the entrepreneur as relevant characteristics. The results of these studies are, however, mixed, amongst others due to limited sample sizes. All in all, the majority of empirical studies on HRM within SMEs doesn't seem to pay systematic attention to other organizational dimensions besides firm size.

Impact of HRM practices: terra incognita

The relationship between HRM and performance is receiving much attention in HRM studies amongst large firms. Amongst small and medium-sized enterprises, this topic is still very much *terra incognita*. Two studies have been identified that examine the relationship between HRM practices and performance measurements: Heneman and Berkley (1999) examine how HRM practices in the field of recruitment and selection affect outcomes of the recruitment and selection process, while Kotey and Meredith (1997) study relationships between personal values of business owners, business strategy and organisational performance. In both studies, positive relationships are found.

Generalization of results of existing studies on HRM within SMEs is not without difficulties. This is especially due to the differences in the size of the firms that are included in the samples. For example, Hornsby and Kuratko (1990) investigate firms with 1-150 employees. Within that sample, differences between smaller and larger firms are identified. Jackson et al. (1989) and Deshpande and Golhar (1994) define small firms as those with less than 250 employees, and Golhar and Deshpande (1997) use a size class boundary of 500 employees. Lower boundaries on the number of employees also differ between studies, and range from 1 employee (Hornsby and Kuratko, 1990), through 10 employees (Deshpande and Golhar, 1994) and 15 employees (Bacon et al., 1996) to a minimum of 100 employees (Duberley and Walley, 1995) or even 250 employees (Snell, 1992). Other studies mention firm-size effects, but present no information on the size of organizations within their sample (Barron et al., 1987).

2.5 Research questions

With the previous section ends our introduction into the field of HRM within SMEs. In this section, we present the objective and research questions for this thesis, after which the main results and conclusions will be presented in the following sections. The research questions can be placed within the context of a broader research agenda, aiming to increase our understanding of HRM practices. This section therefore starts with a presentation of this general research agenda. In addition, we propose a general theoretical framework for this research agenda. This framework combines elements from vari-

ous perspectives on HRM (as discussed in section 2.2), and specifically includes the relevance of firm size and size-related organizational and contextual determinants.

2.5.1 General research agenda

The main findings presented in the previous section indicate that there is still a lot to learn about human resource management within small and medium-sized enterprises. We are in need of theoretical studies as well as empirical research to test these theories. In this section we propose a research agenda, which should help us to move beyond the current explorative research phase. This research agenda distinguishes three main themes: the approaches to HRM that are found within SMEs, determinants of these HRM practices, and their impact.

Unique approaches to HRM within SMEs

HRM practices amongst SMEs have been documented and discussed in various publications. In addition, studies that apply normative HRM models have raised the question to which extent the management of employees within SMEs can be characterised as HRM. What seems to be missing, is an understanding of *why* some enterprises would try to develop a coherent HRM policy, while other enterprises limit their attention for HRM to ad hoc choices for specific practices. We are in need of theories on the relationships between various organizational dimensions and the degree of integration of the HRM practices. The most relevant dimensions seem to be organizational goals and strategy and organizational culture (*i.e.* the personal characteristics of the business owner).

Determinants of HRM practices

Firm size is often used as a contingency or control variable in studies on HRM. However, the number of employees in itself does not explain much. It is often used as an indicator for various other unobserved variables. Furthermore, we have only just begun to examine the differences in HRM practices *between* small and medium-sized enterprises. How can we explain these differences? Are they determined by the same, often unobserved, variables that can explain the general difference between SMEs and large organizations? Future research should try to develop a theory on which organizational dimensions may be considered as predictors of HRM practices for small, medium-sized and/or large enterprises.

Impact of HRM practices

Within mainstream HRM (that is, HRM within large organizations), the impact of HRM practices on various performance measures is currently one of the main areas of research. Do the results of such studies also apply to SMEs? Advocates of a best-practice approach may believe this to be the case. After all, “best practices” are practices that all firms should try to put into practice, irrespective of size or other organizational characteristics. It is, however, possible that “best practices” are contingent on certain characteristics that most large firms have in common, but that differ between small and large firms. Examples of such characteristics may be the level of formalization within the organization, available financial resources and the availability of a certain minimum body of knowledge about HRM. According to a behavioural perspective on HRM, it is even more plausible to assume that the impact of certain (combinations of) HRM practices may differ between small and large firms, and also within the group of small firms.

These differences may be explained by differences in various contextual and structural dimensions.

Theories on the impact of HRM practices can be either general (regarding the overall effect of various HRM practices on performance measures) or specific (examining the conditions under which specific HRM practices are most likely to be successful), and can study the effect on either HRM outcomes (such as inflow and outflow rates, absence rates and job satisfaction) or organizational outcomes (for example, production and value added).

A theoretical framework

Various theoretical perspectives should be combined to tackle this research agenda. Limiting research to a single theoretical perspective beforehand would neglect the complexity of the research agenda, which includes aspects from such diverse research themes as HRM, SMEs, transaction costs and entrepreneurship.

Paauwe (1998) has proposed a general framework on human resource management. This framework combines elements from the resource-based, the behavioural and the institutional perspective, but lacks proper attention for firm size. Therefore, we have combined his framework with Daft's (1998) distinction between various organizational and structural dimensions. Here, firm size is recognised as a specific contextual dimension, which is related with other contextual dimensions (such as goals and strategy, and culture) and structural dimensions (such as formalisation and specialisation). The resulting framework is presented in Figure 2.1. Starting (at the top) with determinants of HRM practices, this framework continues with the resulting unique approaches to HRM, and ends with the impact of those approaches on HRM outcomes and organisational performance.

2.5.2 Objective and research questions of the current thesis

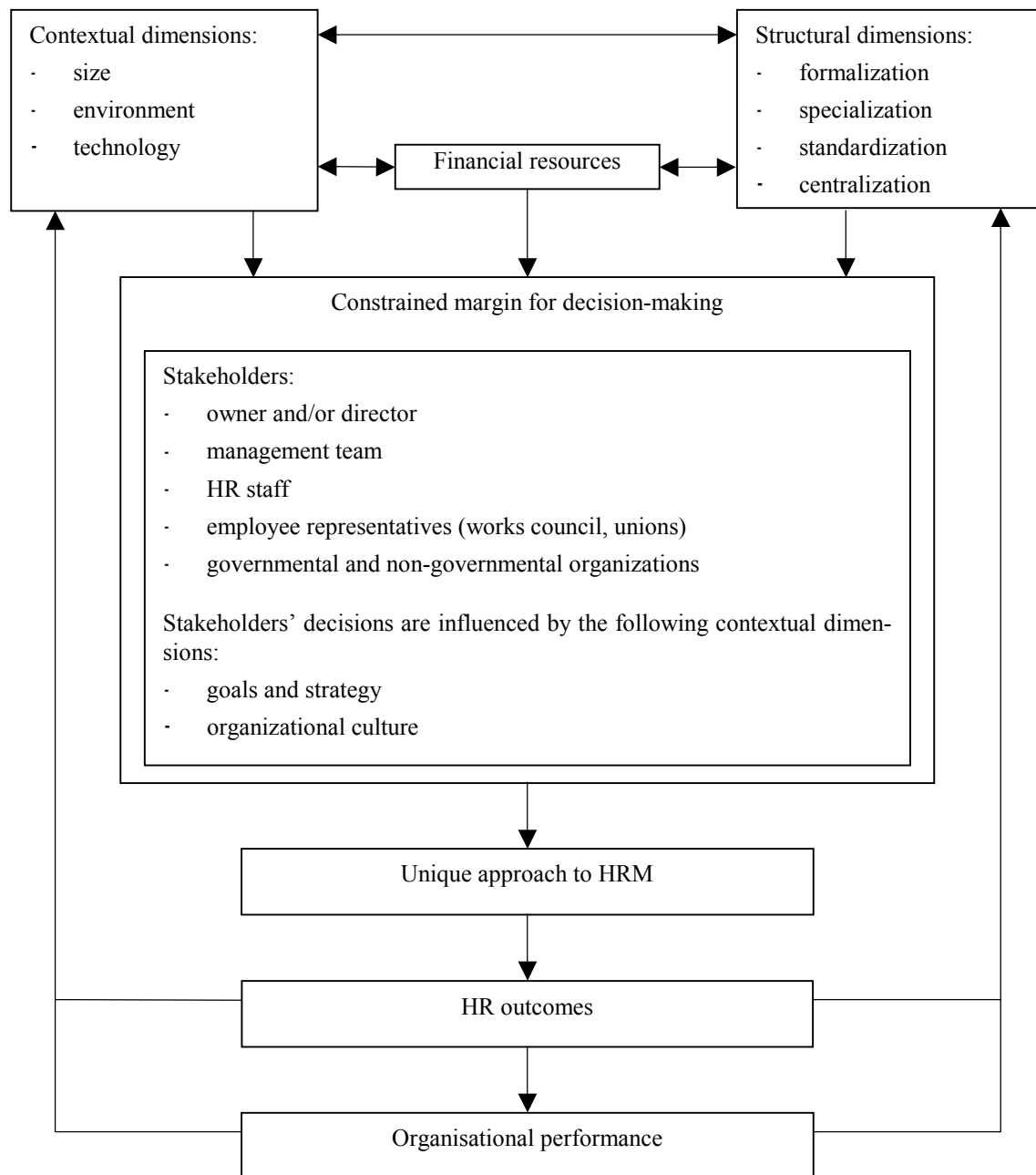
Objective

There is still a lot to learn about human resource management within small and medium-sized enterprises. The objective of the current thesis is, therefore, to increase our general understanding of HRM practices within the population of SMEs.

Making choices

This objective has led to a number of choices to determine which parts of the general research agenda are to be included in this thesis. Given the explorative nature of the current research on HRM within SMEs, the first choice is that this thesis should move beyond this explorative stage. The research questions should be conceptual, in that they focus on the relationship between HRM practices and other variables. In addition, they should be answered by means of quantitative research, and provide a sound theoretical underpinning for specific hypotheses which are then tested empirically.

Previous research on HRM within SMEs has focused on the first theme of the general research agenda (unique approaches to HRM within SMEs). The second choice is therefore to aim our attention at the second and third theme (determinants and impact of HRM practices).

Figure 2.1 A theoretical framework on HRM within SMEs

Source: Based on Paauwe (1998) and Daft (1998).

The third choice is to examine four different research questions rather than concentrating on just one. The first two research questions are concerned with determinants of HRM practices, and the final two with the impact of HRM practices.

The fourth choice is related to the HRM practices that are examined in this thesis. We have chosen a dualistic approach: some research questions focus on specific HRM fields (absenteeism and precautionary actions, and firm-provided training), while other research questions involve various fields of HRM practices (recruitment, selection, com-

pensation, appraisal, and training and development). The latter approach has the advantage that a more comprehensive picture of HRM practices can be drawn. At the same time, the inclusion of numerous HRM practices in an empirical study makes it difficult to identify specific dependent variables. In order to reduce information on various HRM practices to a limited number of dependent variables, we have chosen to examine the usage of high performance HRM practices, in particular the degree to which such practices are applied. The rationale for this choice is the finding that, at least within large firms, “the more of the high performance HRM practices that are used, the better the performance as indicated by productivity, labour turnover or financial indicators” (Guest, 1997, page 272).

Research questions

These choices are reflected in the four research questions of this thesis:

On determinants of HRM practices:

- How may we predict the usage of high performance HRM practices within SMEs from specific contextual variables (chapters three and four)?
- Which factors determine whether enterprises take precautionary actions or not (chapter five)?

On impact of HRM practices:

- Does the impact of firm-provided training differ between small and large firms (chapter six)?
- Can differences in the outcomes of HRM practices explain differences in firm size (chapter seven)?

Personnel economics not included

To answer these research questions, insights from various perspectives will be used. Specifically, all perspectives discussed in section 2.2 will be used, with the exception of personnel economics. The main argument for this choice is personnel economics’ assumption of rational maximising behaviour by employers, who are able to determine the most optimal solution for their situation, given the information they have available. Especially for SMEs, this assumption is not without criticism, as we have discussed in section 2.3. Generally speaking, researchers studying small businesses agree that the role of the person owning/managing an SME is very important (Kotey and Meredith, 1997; Nooteboom, 1993). Personnel economics doesn’t seem to offer the right tools to analyse this central role of the entrepreneur regarding the HRM practises within a firm.

It should be noted, however, that chapters six and seven can be seen as a first attempt to bring elements from personnel economics into HRM research, by introducing formal model building. Chapter six specifies the role of training in a production function of individual firms prior to deriving hypotheses on specific parameters of that function, while chapter seven applies a simulation model on labour flows within individual firms. This simulation model actually models organisational choices as a maximisation problem. Especially the relationship between wages and hierarchical levels contains elements from personnel economics (tournament theory). However, while personnel economics is about deriving conditions under which this type of compensation policy is optimal, we simply assume that this policy is optimal for the simulated firm, and determine the consequences.

2.6 Determinants of HRM practices

The first two research questions aim to examine determinants of HRM practices. The first question includes various categories of HRM practices. In contrast, the second research question focuses on a specific aspect of HRM, namely how enterprises react to and deal with absenteeism. These differences in focus are reflected in differences in the theoretical underpinning of the studies: whereas general theories on HRM will be used to formulate hypotheses regarding the usage of high performance HRM practices, research on absenteeism will be based on specific theories on sickness absence behaviour. This section presents the main results of the three studies that have been performed to answer these two research questions.

2.6.1 Organization context and human resource management in the small firm

Generally speaking, smaller firms apply less high performance HRM practices than larger firms do. To which extent can these firm-size effects be explained by other contextual dimensions?

Based on information obtained from interviews with various small-business owners, we have performed an explorative study to derive and test a model on how certain contextual variables may influence the usage of high performance HRM practices. This model combines insights from the resource-based perspective, behavioural perspective, institutional perspective and transaction cost economics, as well as from empirical studies on HRM within SMEs.

Specific contextual variables that are included in this model, besides firm size, are the presence of a collective labour agreement, the company's strategic orientation toward growth (growth strategy), and whether or not the company is associated with a large firm, either as supplier, purchasing group or franchiser (large-firm associate). These contextual variables may influence certain intermediary variables: requirements from external stakeholders regarding high performance HRM practices, availability of resources, and the perceived value of high performance HRM practices by the CEO. In turn, these intermediary variables may stimulate the usage of high performance HRM practices. The assumption is that if the small-firm CEO has the resources, the know-how, and the recognition of the importance of high performance HRM practices, he or she will develop and implement them. Empirical information on the intermediary variables is not available, so the hypotheses that are formulated directly link the contextual variables to the usage of high performance HRM practices.

A preliminary test of the model is possible, based on information that has been obtained from interviewing small business owners about their human resource management. Using semi-structured interviews has the advantage of providing in-depth information on the particular circumstances and characteristics of each individual enterprise, which may be very helpful in the process of formulating a model. A disadvantage is that comparable and codeable data are only available for a limited number of variables and HRM practices. Especially, information on the application of high performance HRM practices is limited to three variables: usage of written job descriptions, regularity of performance appraisal and availability of firm-provided training.

The admittedly preliminary results suggest that not all contextual variables are equally important. As predicted, firm size is related with the usage of high performance HRM practices, including greater regularity of performance appraisal and greater likelihood of employer-based training. Another finding is the significance of having a large-firm associate. Companies with a large-firm associate are more likely to report having employer-based training programmes. A weak relationship is found between a more growth-oriented strategy and the presence of formal training programmes and performance appraisal. Predictions based on collective labour agreements are not supported.

2.6.2 *High performance HRM practices in small and medium-sized enterprises*

In chapter four, we further develop the model from chapter three. The general structure of the model remains intact: firm size, along with other contextual variables, influences certain intermediary variables, which in turn stimulate the usage of high performance HRM practices. The model has been adapted by including other contextual variables, and by elaborating the intermediary and dependent variables.

The contextual variables that are included in the adapted model reflect the availability of a business plan, the choice to export, the choice to associate with a franchise organization, family ownership of the company, and the degree of unionisation. These contextual variables are supposed to have an effect on the intermediary variables. The role of the available resources has been made more explicit in the adjusted model, by distinguishing between the demand for human resources and the supply of financial resources.

The intermediary variables can have a direct effect on the usage of high performance HRM practices, but also an indirect effect, by increasing the likelihood that an HRM department or manager will be present. In turn, the presence of such a department or manager is hypothesized to stimulate the usage of high performance HRM practices.

Firm size, the availability of a business plan, the choice to export, and the choice to associate with a franchise organization are all hypothesised to be positively related with the presence of an HRM department and/or the usage of high performance HRM practices. Family businesses are expected, *ceteris paribus*, to make less use of high performance HRM practices, and are less likely to have an HRM department.

The hypotheses are tested using information obtained from a written questionnaire on human resource management. The sample includes 695 Dutch firms with 1 to 500 employees from six different sectors of industry. The questionnaire contains items on various fields of HRM practices, including recruitment, selection, training, compensation and appraisal practices. For each of these categories, a separate scale is constructed that represents the usage of high performance HRM practices. In addition, a single scale is constructed that represents the overall usage of high performance HRM practices.

The first part of the empirical analysis focuses on the probability of having an HRM department or manager. According to the calculations, HRM departments are found especially in large, non-family-owned businesses with a written business plan. The presence of an HRM department is independent of the choices to export or to associate with a franchise organization, and of the degree of unionisation.

In the second part of the analysis, regressions are used to determine the extent to which the usage of high performance HRM practices (as measured using various scales) depends on the number of employees and on the other contextual determinants. Large firms are found to make more use of high performance HRM practices than small firms do. This is in line with previous studies. Our study, however, goes one step further by examining possible explanations for this firm-size effect. As it turns out, about half of the firm-size effect can be explained by other contextual variables related to firm size. Corrected for firm size, firms with an HRM department or manager apply more high performance HRM practices than other firms do. On the other hand, enterprises owned and managed by members of a single family apply less high performance HRM practices than non-family businesses do. The choice to export is associated especially with an increased usage of high performance recruitment and selection practices, while franchising only stimulates the usage of high performance training and development practices.

What can we conclude from these findings? First of all, they are consistent with previous studies that find a relationship between firm size and the usage of high performance HRM practices. Smaller firms, on average, make less use of high performance HRM practices, and are less likely to have a specific HRM department or manager, than larger firms are. This not only holds between small and large firms (with at least 500 employees), but also within the sample of small and medium-sized enterprises. Secondly, small firms with a relatively formal strategy-formulation process (as indicated by the presence of a written business plan) are also more likely to apply high performance HRM practices, and are more likely to have an HRM department or manager.

Thirdly, given the previous effects, family businesses make less use of high performance HRM practices than non-family enterprises do. This suggests that managers of family businesses have different goals, attitudes or abilities regarding the management of their personnel than managers of non-family businesses do. This is in accordance with previous studies that indicate that family owners have a relatively strong desire to keep full control over their business, and that they are of the opinion that using formal high performance HRM practices (as well as other policy decisions) may result in a loss of control.

2.6.3 Absenteeism and precautionary actions

The second research question focuses on a specific field of HRM practices: precautionary actions aimed to reduce absenteeism.

The attendance of employees depends on both their ability to attend and their motivation to attend. Absenteeism has been studied from both a psychological and an economical perspective, and both perspectives focus on the motivation to attend. Especially within economic literature, absenteeism is usually treated as a deliberate labour supply adjustment of workers dissatisfied with the number of contracted working hours. Nevertheless, firms may not only try to influence the motivation to attend, but also the ability. The ability to attend depends, amongst others, on the working conditions within the organization. Consequently, one of the ways in which firms can reduce the levels of absenteeism, is by taking precautionary actions to improve working conditions. This is especially relevant for small and medium-sized enterprises: while small firms have on average lower overall absence levels than large firms do, the probability that individual employees have an occupational accident is higher for smaller establishments. The

study presented in chapter five examines the decision of small and medium-sized enterprises whether or not to take precautionary actions.

Firms will implement precautionary actions if the benefits of these actions are believed to outweigh the costs. The expected benefits of precautionary actions are related to the effect of those actions on actual absence levels. It seems plausible that the expected benefits are related to the expected relationship between working conditions and absence levels within the firm. The main hypothesis is, therefore, that organizations that identify a relationship between working conditions and absenteeism (“identification”), are more likely to take precautionary actions. Other hypotheses examine possible determinants of this opinion.

Data has been obtained by means of telephonic interviews amongst Dutch establishments with less than 200 employees, resulting in 579 valid observations. The results clearly show that identification is not a necessary condition for taking precautionary measures. While 37% of all enterprises have taken precautionary measures, only 18% have identified a relationship between working conditions and absenteeism¹⁵. This might be explained by the obligatory status of many precautionary measures (for example, wearing safety helmets at construction sites). Another explanation could be that many respondents think no connection exists between current working conditions and current absenteeism, because of precautionary measures taken in the past.

This finding does not, however, rule out the possibility that identification increases the probability of taking precautionary actions. Further analysis to examine this possibility reveals that the probability of identifying a relationship between working conditions and absenteeism depends on the employer’s assessment of the physical and mental working conditions, on reported physical health complaints and stress complaints, on absence rates and on the number of employees. The main hypothesis is rejected: whether or not such a relationship is identified, is not related to the probability that precautionary measures are taken. Instead, firms are more likely to take precautionary measures if they have more employees, if a larger share of their employees is performing physically demanding work, if physical complaints are made, and if a risk inventory and evaluation have been performed.

The results suggest that most small firms do not have a deliberate policy of reducing absence rates by improving working conditions. This may be due to the low absence rates and the limited management time of small-firm employers. Large firms are more likely to take precautionary actions than smaller organizations are, irrespective of differences in absence levels and in the probability of identifying a relationship between working conditions and absenteeism. This firm-size effect may be due to increased attention from external stakeholders for precautionary actions, differences in legislations, or simply the availability of experience, know-how and manpower to implement certain practices.

¹⁵ These percentages represent weighted observations.

2.7 Impact of HRM practices

The third and fourth research question aim to examine the impact of HRM practices. Again, one of these questions combines various HRM practices, while the other question focuses on a specific aspect of HRM: firm-provided training. This section presents the main results of the studies that have been performed to answer these research questions.

2.7.1 *The impact of firm-provided training on production*

Numerous studies have shown that small firms provide less training to their employees than large firms do. Little is known, however, about the relationship between firm size and the impact of training. Does the impact of firm-provided training on production differ between small and large firms? This is the topic of chapter six.

Generally speaking, training will have two opposite effects on production. On the one hand, training is assumed to raise the productivity of individual employees, which can increase production at organizational level. On the other hand, training reduces the number of productive hours. Usually, empirical studies that try to estimate the impact of firm-provided training on firm performance cannot separate these two effects. This is due to the fact that information on time spent in training is mostly missing. Here, such information is available, which allows us to separate the positive effect of training on productivity from the negative effect on productive hours.

Various arguments can be made, why the impact of firm-provided training may differ between small and large firms. These arguments are related to the management of training: how much training is provided, to which employees, and how are these employees supported? In particular, three different firm-size effects are examined. These are the selection effect, the HRM effect (both indirect firm-size effects) and the scale effect (a direct firm-size effect). The selection effect asserts that the returns to training decrease with the amount of training that has already been taken. According to this effect, the average returns to training would, generally speaking, be lower for larger firms. This is due to the fact that large firms provide on average more training to their employees than small firms do.

The other two effects imply a positive relationship between firm size and the average returns to training. The HRM effect considers the role of training support, which is defined as the time spent on administrating and co-ordinating firm-provided training. According to the HRM effect, training support can be seen as an investment in the quality of the training programme, implying a positive relationship between training support and the returns to training. If small firms provide, on average, less training support to their employees than large firms do, the HRM effect results in an indirect firm-size effect.

The final effect examined in chapter six is the scale effect. Larger firms may benefit from economies of scale: if more employees need to take certain courses, courses can be developed that are adjusted to the specific needs of the firm. Such adjustments can increase the returns to training.

Calculations have been performed using panel data with observations on 173 individual firms, for the years 1990 and 1993. These firms can be divided amongst three size

classes: 40-150 employees, 150-500 employees and more than 500 employees. To test the various hypotheses, panel data estimators have been used to estimate a nested production function, with the number of training days as one of the production factors.

The estimation results only find support for the HRM effect. This implies that the returns to training are, generally speaking, lower for smaller firms, since they provide less training support to their employees. Without training support, training does not seem to have any positive effect on firm performance. These positive training effects may be compared with the negative effect on productive hours. Tentative calculations can be made to determine the break-even point, where the loss in productive hours is just offset by the increase in productivity. For firms with at least 500 employees, a break-even point of 3 or 4 years is found; for firms with less than 150 employees, the average break-even point is at least 20 years. We must however be careful with any conclusions regarding the profitability and desirability of training investments, due to the tentative character of these calculations.

2.7.2 The effects of transaction costs and human capital on firm size

In the first six chapters of this thesis, firm size is treated as an exogenous variable, explaining the usage and/or impact of HRM practices within small and medium-sized enterprises. These HRM practices not only affect specific HRM outcomes (such as in- and outflow of personnel, internal labour flows, and competences and commitments of incumbent workers), but also organizational performance. Which, in turn, is related to firm size (see Figure 2.1)¹⁶. This suggests that firm size may partly depend on (outcomes of) HRM practices. Is this indeed the case? Can differences in the outcomes of HRM practices explain differences in firm size?

Various theories or approaches have been developed that explain variation in firm size. These include transaction cost economics and the labour flow approach from labour economics. The transaction cost approach can be used to examine (transaction) costs of the internal organization. The labour flow approach has pointed towards the interaction between firm size, employee turnover and internal labour flows. In combination with the assumption that employees can differ in their individual qualities, these approaches may be used to explain differences in the size of firms operating in similar environments (for example, within the same sector and country).

To examine the relative importance of these approaches in explaining differences in firm size, we use a simulation model. This model formalizes decisions of a profit-maximizing employer on the optimal number of employees. This decision depends on costs and benefits of recruiting, allocating and supervising employees, and on the costs and benefits of cooperation between employees. Individual employees can have different qualities. The quality of new employees (and the exit rate of incumbent workers) is modelled as a stochastic process. To account for these random processes, all simulation experiments are replicated 100 times.

The parameters of the model are calibrated in such a way that the baseline calibration generates a benchmark representative firm with several hierarchical levels. The flow

¹⁶ Firm size may even be considered as a performance measure itself, at least for firms with a specific growth strategy.

characteristics of this firm (quits, fires, and internal and external worker flows) mimic the results found in scarcely available empirical studies. The first simulation experiments examine to which extent the survival rate and size of this benchmark firm depend on average labour productivity and specialization. Next, this information is used to model two new benchmark firms: a small firm (25 employees on average) and a large firm (790 employees on average). The final set of simulation experiments consists of sensitivity analyses performed on these two benchmark firms.

The model provides explanations for differences in size between enterprises operating in similar environments. Two sources for such size differences are identified. The first source is differences in transaction costs that may lead to size differences between otherwise comparable firms. This effect is already explained by microeconomic theory, but the possibility that the impact of transaction costs on the number of employees may be different for small and large firms has been ignored. Our study demonstrates that such effects can exist: simulation experiments show that small firms are less sensitive to changes in transaction costs than large firms are.

The second source of size differences is heterogeneity of labour supply and the reaction of personnel management to this heterogeneity. Even when transaction costs are the same for similar firms, their sizes may differ due to variations in the qualities and qualifications of incumbent workers. These variations are, in fact, variations in the outcomes of various HRM processes. As such, they are due to variations in the quality or effectiveness of those HRM programmes and procedures, such as hiring procedures, training programmes, the matching of employees to internally available vacancies, and the extent to which the organization can improve the motivation and job satisfaction of employees. Although we have not explicitly modelled these HRM processes, the qualities and qualifications of employees can be interpreted as the outcomes of these processes. While we are unable to determine the most efficient way in which to shape these HRM processes, we can determine to which extent variations in the efficiency of these processes affect various organizational processes, and, ultimately, the survival and size of the organization.

The magnitude of this effect of labour heterogeneity appears again to be different in small businesses and large businesses. In our simulation model, the relative influence that labour heterogeneity has on firm size depends crucially on the ratio between transaction costs and wage costs. This is due to the assumption of marginal productivity wages, whereby wage costs per unit of production are independent of the human capital of individual employees. Transaction costs, on the other hand, are negatively related with the amount of human capital. In our calibrated model, small businesses with a relatively flat organization and few hierarchical levels face relatively few transaction costs, but transaction costs gain importance when the number of hierarchical levels rises and intra-firm bureaucracy increases. Therefore, the impact of labour heterogeneity (and, therefore, the scope for HRM) on firm size is more severe in large enterprises than in small enterprises. Within small firms, labour heterogeneity has a different kind of impact: differences in qualities of individual employees have no impact on the number of employees (given that the firm survives), but on the continuity and survival of the firm instead.

2.8 Conclusions

To increase our general understanding of human resource management practices within SMEs, we have examined four different research questions. This section brings together the main conclusions regarding these research questions, and in the final section of this chapter we present some remarks on how our findings relate to the main body of knowledge on HRM within SMEs.

The first research question is how we may predict the usage of high performance HRM practices within SMEs. We find that, within a population of firms with 1 to 500 employees, larger firms apply more high performance HRM practices than smaller firms do. Firm-size effects are usually interpreted as indicators for the relevance of structural dimensions such as the degree of centralization, standardization, specialization and formalization. We find, however, that at least half of the firm-size effect in our sample can be explained by contextual dimensions. Once we take certain contextual determinants into account, the firm size effect becomes substantially less, and even insignificant for the usage of high performance compensation and appraisal practices. Family-owned and family-managed organizations make relatively little use of high performance HRM practices, which is also the case for businesses without a business plan. These businesses are also less likely to have an HRM department or HRM manager. The presence of an HRM department or manager is related to an increased usage of high performance HRM practices, which implies that firm size, family ownership and the availability of a business plan are both directly and indirectly related to the usage of high performance HRM practices.

The second research question focuses on absenteeism, and questions which factors determine whether enterprises take precautionary actions to reduce absence levels. Our results suggest that the probability that firms take precautionary actions increases with the assumed share of employees for whom the working conditions are physically demanding, and is higher for establishments that have recorded physical complaints. In addition, larger enterprises, as well as establishments that are part of a larger organization, are more likely to take precautionary actions, as are establishments that perform a risk inventory and evaluation (RI&E). The decision whether or not to take precautionary actions is independent of the actual absence rate and of the assumed share of employees for whom the working conditions are mentally demanding. In addition, and contrary to our expectations, it is also independent of the employer's opinion whether or not absence rates are related to the working conditions within the organization.

The third research question concerns the impact of firm-provided training. Does the impact of firm-provided training differ between small and large firms? Our results suggest that this is indeed the case. Both small and large firms benefit from firm-provided training, in that it increases the productivity of employees. The impact of firm-provided training on labour productivity is found to be positively related with the amount of training support that firms provide: firms that invest more time in setting up and managing their training activities enjoy higher benefits of training. On average, large firms provide relatively more training support to their employees than smaller firms do. This results in an indirect firm-size effect, whereby the productivity increase of an additional training day is positively correlated with firm size.

The final research question that we have examined is whether differences in the outcomes of HRM practices can explain differences in firm size. Based on exercises with a

simulation model, this research question can be answered positively. This model formalizes decisions of a profit-maximizing employer on the optimal number of employees, taking account of costs and benefits of recruiting, allocating and supervising employees, and on the costs and benefits of cooperation between employees. Simulation exercises with this model show that heterogeneity of labour supply is a possible explanation for differences in the size of enterprises that operate in similar environments.

Although we have not explicitly modelled HRM processes, the qualities and qualifications of incumbent employees can be interpreted as the outcomes of specific HRM practices. As such, differences in these qualities are due to variations in the quality or effectiveness of those HRM programmes and procedures, such as hiring procedures, training programmes, the matching of employees to internally available vacancies, and the extent to which the organization can improve the motivation and job satisfaction of employees.

Also here, the impact of labour heterogeneity on firm size appears to be different for small and large enterprises. In our calibrated model, small businesses with a relatively flat organization and few hierarchical levels face relatively few transaction costs, but transaction costs gain importance when the number of hierarchical levels rises and intra-firm bureaucracy increases. Therefore, the impact of labour heterogeneity (and, therefore, the scope for HRM) on firm size is more severe in large enterprises than in small enterprises. For small firms, labour heterogeneity does not matter for their size, but for their survival.

2.9 Final remarks

How to manage an organization's workforce is a fundamental aspect of each organization, irrespective of its size. Enterprises are faced with the task of recruiting and retaining a suitable workforce. This is not only a challenge for large enterprises, but also for small and medium-sized enterprises. For example, over 20% of all European SMEs report that during the end of the 1990's, recruiting skilled employees has been their major business constraint (European Commission, 2002)¹⁷.

Studies on the impact of HRM practices within large firms show that an increased usage of high performance HRM practices is generally associated with improved firm performance (Boselie et al., 2001; Guest, 1997). Comparable research has not been performed with small or medium-sized enterprises, but our results from the simulation model suggest that the quality or efficiency of HRM practices may also be important to explain the performance of small firms: as McEvoy (1984) already suggested, HRM practices may be an important cause of small-firm success or failure. Since HRM practices have not been modelled explicitly, the simulation model doesn't allow us to determine what an effective HRM policy looks like, nor whether it depends on the application of specific formal high performance HRM practices. It may well be the case that for small firms, informal HRM practices are often to be preferred over more formal high

¹⁷ Amongst others, this holds for 20% of all firms with 0-9 employees and 30% of all firms with 10-49 employees.

performance practices, given the informal manner in which small organizations often operate.

Having said this, our examination of the impact of firm-provided training suggests that at least for this field of HRM practices, medium-sized organizations also benefit from a more formal approach. At least, if this formal approach includes a fair amount of training support per employee. The results indicate that training can improve firm performance, as long as employees receive enough training support. Firms that are faced with a limited training budget should be aware that only a part of this budget should be spent on training courses themselves; especially firms with less than 150 employees should consider spending less money on training courses, and more time on supporting employees that follow a training course. Case studies amongst small British firms that followed the Investors in People programme also conclude that even small firms benefit from a more formal training approach (Goss et al., 1994).

The answers to the third and fourth research question of this thesis suggest that HRM practices do indeed matter for the performance of small and medium-sized enterprises. This is in line with the studies by Heneman and Berkley (1999) and Kotey and Meredith (1997), which can be seen as the first studies of the impact of HRM practices on the performance of SMEs. Knowing the importance of HRM practices for SMEs, it becomes relevant to know how these enterprises determine their choice of HRM practices. What is the relationship between contextual and structural dimensions and the unique HRM approaches of SMEs?

That smaller firms apply less high performance HRM practices than large firms do, has already been established. The aim of the first research question was to determine to which extent this firm-size effect could be explained by differences in contextual dimensions. Our results suggest that roughly half of the firm size effect can be explained by differences in contextual variables. An especially important determinant is ownership. Enterprises that are owned and managed by members of a single family are less likely to use high performance HRM practices. In addition, having an HRM department or HRM manager stimulates the usage of such practices.

When discussing the usage of high performance HRM practices, we must keep in mind that we are, in fact, discussing the average usage of various categories of HRM practices. Our results suggest that enterprises show considerable variation in the degree to which they apply high performance practices in various HRM categories. The correlations between the scales on high performance HRM practices that we derive in chapter four vary between 0.33 and 0.52. Based on our interviews with 16 small-business owners (chapter three), we even cannot reject the hypothesis that the applications of three specific high performance HRM practices are independent of each other.

One of the implications of this within-firm variation in the usage of high performance HRM practices is that it warrants more in-depth studies in specific HRM categories. The chapters on absenteeism and firm-provided training can be seen as examples of such an approach.

We still need to learn a lot about how (and why) firms actually manage their personnel, and how they may improve their current practices. In this thesis we have looked for differences between smaller and larger firms, and tried to explain these firm-size effects with other (contextual) dimensions. The number of employees in itself often doesn't ex-

plain much; it is frequently used as an indicator for other non-observed variables. In our empirical studies, we have identified some of these variables.

Nevertheless, the number of employees does explain some differences in HRM practices. Especially within very small enterprises, where hiring and selection occurs only once or twice a year (or even less), and outflow is limited, the character of HRM will be very different than with large multinationals. Within these small firms, personnel management may be dominated by the social skills of the manager or business owner, rather than by the application of various specific (high performance) HRM practices. Research into the management of personnel would then in fact become research into entrepreneurship and leadership styles.

Chapter 3: Organization context and human resource management in the small firm

3.1 Introduction

HRM is becoming increasingly important in the new “knowledge-based” economy, as companies face the double challenge of the need for more highly trained employees coupled with a shortage of qualified labour. These challenges, coupled with the third trend toward smaller firms in general, reinforce the need for effective HRM practices in the small firm (Audretsch and Thurik, 2000, 2001). It is therefore not surprising that research on HRM practices in small and medium-sized enterprises has captured increased attention in recent years.

The basic assumptions in this line of research frequently include homogeneity among smaller firms: small firms are assumed to have a simple structure, characterised by low levels of formalization and specialisation, and high levels of centralisation (Paauwe, 1989; Schermerhorn et al., 2000). In line with this assumption, HRM practices are assumed to be informal (if present at all), and high performance HRM practices are assumed to be virtually lacking.

A growing base of research evidence, however, shows that there are many exceptions to this pattern¹⁸. Apart from firm size, other relevant contextual factors may influence HRM practices as well. In this chapter we derive and test a model that relates the presence of high performance HRM practices within small and medium-sized enterprises to certain aspects of their organizational context.

As defined by Daft (1998), organization contextual variables include firm size, strategy, technology, culture and the environment (especially other organizations or institutions). These variables have been identified as possible predictors of high performance HRM practices in several studies (Arthur and Hendry, 1990; Buller, 1988; Jackson et al., 1989; Schuler et al., 1989), which in turn may stimulate organisational performance (Guest, 1997). In the following two sections, elements of various theoretical perspectives, including the resource-based approach, institutional theory, transaction cost economics (TCE), behavioral theory and other concepts from strategic management, are used to develop the rationale for proposed linkages. In sections 3.4 to 3.6, we present qualitative and quantitative results of a pilot study of HRM practices in a sample of sixteen small Dutch firms. These results are intended as a preliminary test of the model. The chapter concludes with recommended directions for further research.

¹⁸ See section 2.4 for a discussion of previous studies on HRM within SMEs.

3.2 Organization contextual variables and HRM: a transaction cost perspective

We build our rationale from a blend of theoretical perspectives. The resource-based view highlights the importance of the environment in building up human resource capabilities. Institutional theory provides a different perspective on the role of the environment in shaping expectations about management practices within the small firm. The behavioral perspective and other research from the strategic management literature focuses on the role strategy may play in shaping HRM practices. In addition to these perspectives, which have been discussed in chapter two, we incorporate elements from transaction cost economics (TCE). TCE is especially helpful in understanding how certain players from the environment (other private organizations in particular) may serve to mediate the disadvantages of size and scale effects in the small firm.

Within transaction cost economics, the units of observation are individual transactions. Transactions can take place either within or between firms. Transaction costs arise because of bounded rational and opportunistic behavior of the transaction parties involved.

Using the TCE perspective, Nooteboom discusses the special case of the small firm in detail (Nooteboom, 1993). He explains that small firms are often at a disadvantage relative to large firms with respect to costs, due to smaller volume produced (scale) and fewer products (scope). They may also be characterized by less experience and more limited capacity for the acquisition of knowledge (Nooteboom, 1993). As Nooteboom points out, whereas TCE generally focuses on the make-or-buy decision among large firms, for small firms, neither choice may be valid. The small company may have neither the resources to develop needed programs in-house nor the resources to search, evaluate and negotiate for quality programs from the outside. Nooteboom concludes that small companies often lack more sophisticated programs because they lack the resources to implement them, not because such programs are less appropriate to the small firm.

Nooteboom (1993) suggests that there may be strategies to lower transaction costs for small firms, either through their own initiatives, such as collective cooperation among a group of small firms (e.g. for technology development or a buying group) or with outside help. For instance, technology transfer programs sponsored by the government or other institutions may provide a way to lower the “thresholds in transaction costs” so that adoption can take place (Nooteboom, 1993: page 294). Research by Goss et al. (1994) provides a good practical demonstration of this point. They examine a group of companies wishing to receive the national designation of Investor in People from the British government. Goss et al. (1994) provide case support for the ability of small companies to learn to copy HRM practices. In particular, they report that participating companies are often successful at adopting more sophisticated practices after being given the proper structure or blueprint for more formal HRM systems. Using Nooteboom’s logic, one could argue that by absorbing the search and development costs for HRM, this program reduces the transaction costs for those companies adapting these techniques. Another demonstration is provided by Zacharakis (1997), who uses TCE to explain entrepreneurial entry into foreign markets. Although not related to HRM practices per se, the study demonstrates that utilizing a partner with some knowledge of the target market can help leverage the entrepreneur’s resources (with an export agent, licensing, joint ventures, etc.), thus lowering their transaction costs.

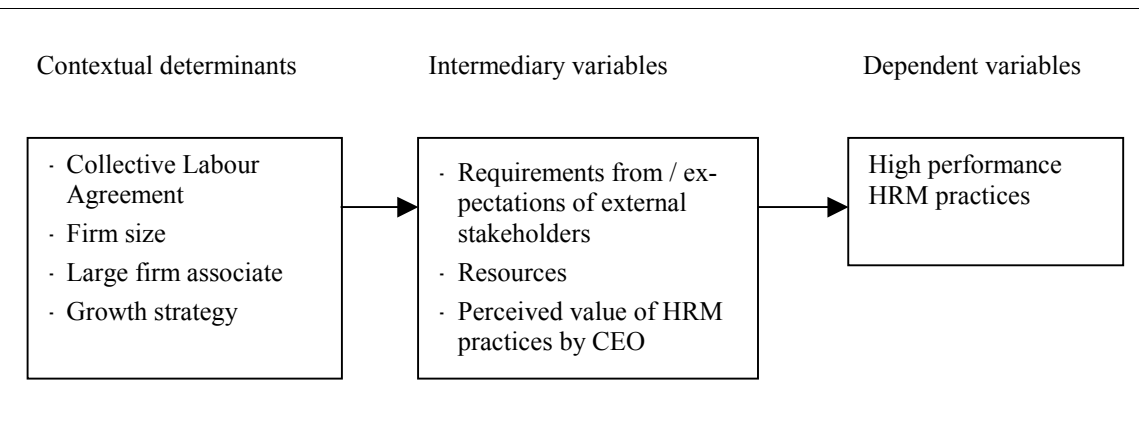
The application of TCE within entrepreneurship research is still in its early stages and does not always obtain clear predictive support. For instance, Klaas et al. (2000) find a lack of support for TCE predictions regarding outsourcing of the HRM function in smaller firms. Nevertheless, TCE may provide an added theoretical basis for certain predictions involving HRM practices within smaller firms.

In sum, the rationale drawn from TCE is that the lack of high performance HRM practices in smaller firms is not due to size per se, but can be attributed to the generally higher costs required to develop specific programs that fit the needs of the smaller firm. However, government assistance and/or private-sector partnerships may serve to lower a small company's transaction costs for introducing new HRM practices. This may explain some of the differences in the usage of high performance HRM practices among similarly-sized firms.

3.3 The Proposed Model and Hypotheses

Although smaller firms in general make less use of high performance HRM practices (variously defined) than larger firms do, a substantial amount of unexplained variation still remains across small firms. The objective of this chapter is to identify possible underlying explanations for this variation. We propose a model that explains the number of high performance HRM practices that are applied, combining elements from the resource-based approach, transaction cost economics, the institutional approach and the strategic contingency approach. The proposed model is depicted in Figure 3.1.

Figure 3.1 A model of HRM practices



The model presents a short list of independent contextual variables: in addition to firm size, we investigate the impact of the presence of a CLA, access to a larger company supplier or customer closely associated with the company (referred to as “large firm associate” in the model) and the orientation toward growth as a strategy (referred to as “growth strategy”). These four contextual variables together are thought to influence the number of applied high performance HRM practices. The reader should note that the model is not intended as a comprehensive list of all possible organization contextual predictors, but rather as a starting point upon which other research can build.

The proposed model includes a set of three intermediary “latent” variables. These are variables not directly measured in this research, but provide the underlying rationale for

the linkages between the independent and dependent variables. The underlying assumption is that if the small company CEO has the resources, the know-how, and the recognition of the importance of high performance HRM practices, he or she will develop and implement them. The specific hypotheses to be tested that are implied by this model will be discussed in the remainder of this section.

Collective labour agreements

In the Netherlands, CLAs often prescribe the expected approach to be taken in HRM practices. These prescriptions often refer to high performance HRM practices, e.g. written job descriptions, performance appraisals or formal employee training programs. These CLAs vary by sector, with some being more specific than others. Generally, such documents primarily provide expectations of labour unions and the government. Nevertheless, for some sectors (e.g. metal) actual tools may be provided in the agreement, such as examples of written job descriptions for each of the standard job classifications. In those cases, the development costs for implementing such programs are reduced and the adoption rate is expected to be higher. Further, the Dutch government generally provides neither funding or assistance to execute such agreements, nor sanctions against nonexecution of part or all the agreement unless an employee files a grievance. However the latter is rarely done. Thus, in the proposed model, the CLA requirements are presumed to have an indirect impact on HRM practices primarily by heightening the awareness of such HRM practices by the CEO, and by clarifying the expectations of certain stakeholder groups (organized labour and the government). To the extent that an understanding of such expectations influences the CEO's decisions in implementing various HRM practices, and in accordance with institutional theory predictions, we propose the first hypothesis as follows:

H3.1: Small companies with collective labour agreements make more use of high performance HRM practices than companies without such agreements.

Firm size

Scale effects, based on firm size, have been fairly well substantiated in the literature and are also included in the proposed model. The TCE perspective provides one rationale for the impact of size on the development of high performance HRM practices. Most of these practices, such as training programs, performance appraisal instruments, and written job descriptions, require considerable development costs to be done correctly (Klaas et al., 2000). According to both the resource-based and the TCE perspective, most small firms lack the resources for development costs, in spite of a possible need for specialized programs. With the advantages of scale, larger companies have more resources to cover development costs (Nooteboom, 1993).

Financial resources are not the only intermediary between firm size and the application of high performance HRM practices, as can be seen in Figure 3.1. For instance, larger companies may be held to different legal standards by the government, as in the United States. Given their size, they may also be more likely to have HRM specialists on staff familiar with high performance HRM practices. Larger companies may also have a greater need to systematize their practices to manage a large-scale labour force more efficiently. For all these reasons, we propose the second hypothesis of this chapter as follows:

H3.2: Larger companies make more use of high performance HRM practices than smaller companies.

Franchising and supplier or customer networks

Using the TCE perspective and resource-based perspective, we posit that a larger firm partner or “associate” can help the small firm to reduce the transaction costs associated with development of high performance HRM practices (Gales and Blackburn, 1990; Zacharakis, 1997). The rationale for hypothesis H3.2 already explains why we would expect larger firms to apply more high performance HRM practices. Small companies working with a larger firm may benefit from this knowledge. In particular, smaller companies that work closely with a larger company, either as a supplier, customer, or franchiser, may gain access to relevant HRM programs from the larger firm (e.g. a training module or performance appraisal instrument). This lowers the development costs (and thus the resources required). The large firm associate may also communicate higher expectations to their associated small firms regarding the value of high performance HRM practices (e.g. through ISO9000 standards, etc.). Finally, close contact with a larger firm associate may result in a better understanding by the small firm CEO of some of the benefits of such practices. Thus, hypothesis H3.3 is as follows:

H3.3: Small companies associated with a larger firm (through a supply or customer network or franchise) apply more high performance HRM practices than those companies that lack such an association.

Growth strategies

Finally, based upon the behavioral and strategic contingency perspectives and other empirical research (Lengnick-Hall and Lengnick-Hall, 1988; Thakur, 1998), we propose that companies that are more growth-oriented may also be more apt to recognize the perceived value of HRM practices to build a more competent employee base. Thus, these firms are more likely to develop high performance HRM practices than those without a growth-oriented strategy. The fourth hypothesis is therefore as follows:

H3.4: Small companies with a growth strategy apply more high performance HRM practices than those small companies without a growth strategy.

3.4 Research Method

3.4.1 Sample and data collection techniques

To test the model and hypotheses presented in the previous section, a series of semi-structured interviews were conducted in the summer of 1997 with twenty Dutch SMEs. Four companies are excluded from analyses—three are subsidiaries of larger firms and one is an outlier with respect to size (125 employees). The remaining companies range in size from 10 to 41 employees, representing four different sectors: metal products and machinery manufacturing (metal), food retail, cleaning services and information and communication technology (ICT). The first three sectors are subject to CLAs.

Given the exploratory nature of the research and the small sample size, it was decided to include companies past the initial start-up phase, which were assumed to have solidified

their HRM practices. Thus, only firms five years and older were selected to participate in the pilot study. Table 3.1 provides a description of the participating companies by sector and size.

Table 3.1 Sector and firm size statistics for the sample

	Sample size	Firm size (no. of employees ^a)	
		Mean	Range
Cleaning services	3	14.0	10-18
Metal products and machinery manufacturing ^b	5	17.0	10-25
Information and communication technology	3	19.0	12-25
Retail (food)	5	22.8	10-41
Total	16	17.6	10-41

a: excluding owners.

b: size missing for one company.

The structure of the semi-structured interviews is based on a classification system of HRM practices developed by Fisscher et al. (1988). Within this system, three classes of HRM practices are distinguished: practices pertaining to flow of employees into and out of the organization, control procedures, and development activities (e.g. training and career development). Though this approach provides a rather detailed set of comments, because of the methodology used (i.e., open-ended questions), comparable and codeable data are only available for a limited number of high performance HRM practices: written job descriptions, regularity of performance appraisal and the availability of employer-based training.

Table 3.2 summarizes the way in which each of the independent and dependent variables are measured. Two variables are used as indicators for collective labour agreements. The variable CLA contains the scores on a three-point scale that takes account of the heterogeneity of the CLAs, as far as HRM requirements are concerned. The lowest score is reserved for companies without a CLA, the highest score for companies with detailed HRM requirements (metal sector). Alternatively, the sector dummy for metal can be used as an indicator for companies with CLAs that contain detailed HRM requirements. In the case of the metal sector, the CLA specifies extensive requirements, including use of predefined job descriptions (provided within the CLA document), an annual training program and the requirement to give a donation to an organization to promote and develop training courses.

Table 3.2 Independent and dependent variables obtained from the pilot study

Variables	Answer categories
<i>Independent variables:</i>	
Firm size	Number of full-time and part-time employees
Collective Labour Agreement (CLA)	No CLA CLA with limited requirements regarding HRM practices CLA specifying extensive requirements
Metal sector	All other sectors Metal products and machinery manufacturing sector
Large firm associate	No association with an outside firm Association with an outside firm, either as supplier or franchisor
Growth strategy	Intention to contract Intention to remain stable Intention to grow
<i>Dependent variables:</i>	
Written job descriptions	Absence of written job descriptions Presence of written job descriptions
Regularity of performance appraisal	Never Seldom Regularly
Formal (employer-based) training programme	Training nor or seldom offered, or offered ad hoc as an initiative by employees Initiative by employer, with a training budget and plan available

note: for each variable, answer categories are presented in ascending order.

3.4.2 Data analysis

Both qualitative and quantitative analysis techniques are applied to the data set. In the qualitative analysis, respondent comments are sorted according to the main HRM practices, including HRM planning, recruitment, selection, performance appraisal, compensation and benefits, training and development, and team building. Because these categories are different than those used in the original study (set up by a different team of researchers), data are missing and/or not uniform enough for quantitative comparison for all categories. However, the available case studies provide a preliminary look at some aspects of the model presented in Figure 3.1.

In spite of the small and nonrandomly drawn sample, in the second part of the analysis quantitative statistical techniques are used to examine the four proposed hypotheses. In cases where both independent and dependent variables are dichotomous variables, Fisher's Exact Test is chosen to test for independence of the two variables. The Fisher's Exact Test is particularly well suited to this dataset because of the very low count in some of the cells of the 2x2 tables. For these analyses, the Phi coefficient is then used to test for the direction of the relationship. For the remaining relationships (i.e. where at least one of the two variables was an ordinal variable with three or more data points) the

Pearson Product-Moment Correlation Coefficient is used to measure both the strength and direction of the relationship.

3.5 Results

3.5.1 *Qualitative analysis*

Annex 3.1 presents a summary of five of the sixteen cases examined for the qualitative analysis. Within the size range of relatively small companies included in the study (between 10 and 50 employees), companies display a large variation in approach to HRM practices. This is consistent with the findings in previously reported studies.

Case 1, a small specialty grocery store, fits the stereotype of the typical small firm. The degree of formalization of HRM practices is limited. The CEO reports that he provides periodic performance feedback, but recruitment remains informal -- within the immediate circle of family and friends. Moreover, training and development is not carried out and team building consists of an annual outing with employees.

By contrast, case 2, a somewhat larger supermarket, has fairly highly developed HRM practices. Perhaps some of this difference is due to its larger size. The respondent also makes specific reference to the influence of the large firm associate on HRM practices—in this case a large Dutch grocery-purchasing group. The CEO specifically notes that the purchasing group impacts overall HRM planning, as well as the training program. Recruitment is also more professionalised, with reliance on a job center, newspaper advertisements and shop posters. The CEO in case 2 also seems to pay more attention to the CLA that applies to food companies. He reports that job descriptions as well as rewards follow the guidelines of the food retail CLA. Thus, although size is definitely an issue here, the influence of the large firm associate and greater attention paid to the CLA (perhaps as an interaction with size) is also relevant for this case.

Cases 3 and 4, both in the ICT sector, are not covered by a CLA in the Netherlands. Whereas case 3 reports a larger company business partner, IBM, as its large firm associate, case 4 reports no large company associations. Again, HRM practices for these two companies, matched for size, are quite different. The influence of the business partner comes through strongly in several aspects of HRM practices found with case 3, including HRM planning, training programs, and written job descriptions. This firm also reports the usage of high performance HRM practices in the field of recruitment, using far more channels outside the immediate circle of family, friends, and employees, and the use of a selection test for programmers. Again, given the small firm size, these cases appear to demonstrate the relative importance of the large firm associate in explaining company differences. The higher growth orientation of cases 2 and 3 may also help to explain their usage of more high performance HRM practices relative to the other firms.

Case 5, roughly within the same size range as the other cases, belongs to the metal sector. In spite of a rather strict CLA spelling out a number of requirements for more formal HRM practices, case 5 tends to have a fairly informal approach to HRM practices. Case 5 aims at somewhat limited growth. It has adopted a few high performance HRM practices, including the use of a temporary employment agency for recruitment, using skill level as a criterion when hiring, and performance appraisals when employees perform poorly. Also, it pays attention to some of the CLA requirements (in compensation

but not job descriptions). It may be argued that because of a very low turnover rate (less than one employee per year), and a relatively limited growth rate, high performance HRM practices are not considered particularly important. Finally, it is interesting to note that case 5 fails to use written job descriptions, given that examples are provided for all metal job classifications in the metal CLA.

3.5.2 Quantitative analysis

Table 3.3 provides a summary of other sample characteristics, in addition to the size and sector data presented previously in Table 3.1 for the total group of sixteen firms.

Table 3.3 Other descriptive statistics of the sample

Variable	Valid observations	Characteristic present	Valid percentage
Large firm associate	16	5	31%
Growth strategy	15	5	33%
HRM specialist	16	0	0%
Regular performance appraisals	13	3	23%
Written job descriptions	16	6	38%
Formal training program	16	5	31%

About a third report the intention to grow with or without a recent growth spurt and one-third report having a link with a “large firm associate”. About two-thirds are covered by a CLA. Although none of the companies have an HRM department or even HRM staff, about a quarter to one-third do report having formal training programs (5 out of 16 companies), written job descriptions (6 out of 16 companies) and/or regular performance appraisals (3 out of 13 companies).

Table 3.4 presents results of the quantitative tests for the four proposed hypotheses, as well as tests for the interrelationships among the independent and dependent variables. Looking first at the interrelationships among the independent variables, firm size is associated with both growth strategy and the presence of a large firm associate. In addition, the presence of a large firm associate is related with growth strategy. The CLA variable is highly correlated with the metal sector dummy variable, but this is to be expected since both are based on the sector classification of the companies. The presence of a CLA is unrelated to the other three independent variables. The three dependent variables (regularity of performance appraisal, written job descriptions and the availability of a formal (employer-based) training program) are also completely unrelated to one another, even though they each represent a high performance HRM practice. Therefore, hypotheses were tested for each dependent variable separately.

Table 3.4 Correlation matrix for dependent and independent variables

Variable		1	2	3	4	5	6	7
Collective Labour Agreement ^a	1							
Metal sector ^b	2	.85						
Number of employees	3	-.09	-.13					
Large firm associate ^b	4	-.32	-.46	.61**				
Growth strategy	5	-.16	.10	.53**	.46*			
Regularity of performance appraisal	6	.00	-.25	.52*	.47	.57*		
Written job descriptions ^b	7	.42	.59**	.35	.04	.26	.00	
Formal training program ^b	8	-.51**	-.45	.68***	.71**	.46*	.23	.04

*: significant at 10% level.

**: significant at 5% level.

***: significant at 1% level.

a: within our dataset, the variable "Collective Labour Agreement" is equivalent to a dummy for the ict sector.

b: dummy variable. The relationship between two nominal variables is measured by the Phi test of association. For dummy variables, the Phi coefficient is identical to Pearson's correlation. Fisher's exact test is used to test for dependency between two dummy variables.

3.6 Discussion

3.6.1 Support for hypotheses

Hypothesis H3.1 posits that the presence of a CLA will be associated with the application of high performance HRM practices. No support is found for this hypothesis. The only significant correlation (between CLA and the presence of a formal training program) is opposite to the predicted direction. However, the metal sector dummy variable is positively associated with the presence of job descriptions (which is in the expected direction). Perhaps this is due to the fact that the CLA for the metal sector has the most specific requirements for written job descriptions and also includes examples for companies to use. Thus, in addition to clarifying stakeholder expectations, added resources are provided to implement this requirement.

The weak support for hypothesis H3.1, with the above exception, points to the possibility that external stakeholder expectations alone have only a minor influence on the actual practices chosen to implement. Added supplemental resources (as are provided by the job descriptions provided in the metal CLA), or the appreciation for the value of a practice by the CEO may be required to assure the development and implementation of mandated HRM practices. The presence of a CLA is even negatively associated with formal training programs in spite of the fact that it is specifically required in the metal sector. Given the small sample size, it is difficult to distinguish the CLA effect from other sector effects. For instance, within the ICT sector, where state-of-the art learning is critical to maintain competitiveness, much attention is paid to training and development. Further research examining CLA and sector effects separately and using a broader range of CLA and nonCLA sectors is needed to test this hypothesis further.

Hypothesis H3.2, with firm size as independent variable, is most clearly supported for the presence of a formal training program ($r=.68$; $p<.01$). A positive correlation ($r=.52$; $p<.1$) between firm size and the regularity of performance appraisal also suggests a relationship to be tested using a larger sample. Comparing the results of hypotheses H3.1 and H3.2 would attribute more explanatory power to the TCE perspective and resource-based approach than to institutional theory.

Empirical support for the third hypothesis is limited to a significant relationship between the presence of a large firm associate and the application of high performance HRM practices. Statistically speaking, this relationship is rather strong ($r=.71$; $p<.01$). The hypothesis is not supported, however, for regularity of performance appraisal or written job descriptions.

Given that size and the large firm associate variable are strongly correlated, both with one another and with the dependent variable (formal training program), an obvious question is whether the large firm associate variable has an effect on training independent of firm size. Further analysis of the data using partial correlations provides support for this conclusion. Controlling for firm size, the partial correlation between the large firm associate variable and the dependent variable of formal training becomes 0.49, which is significant at a 10% significance level. It is again noted that the data set is very small and conclusions should be revalidated on larger, randomly drawn samples.

Finally, relatively weak but consistent support is found for hypothesis H3.4, the relationship between growth strategy and the application of high performance HRM practices. For two of the three indicators - regularity of performance appraisal and formal training programs - the relationship found is significant at the 10% significance level. This effect may be weak due to the small sample size and small number of companies pursuing a growth strategy. However the trends hint at the potential usefulness of pursuing this line of thinking in further research on a larger randomly drawn sample of small companies.

3.6.2 Further discussion and suggestions for future research

The results of this pilot study point to a number of interesting directions for further exploration. First, consistent with past research, even within a small sample with relatively narrow size ranges, firm size appears to be an important predictor of at least two of the indicators of high performance HRM practices. This confirms the importance of scale in predicting the overall shape of organizations.

Second, even though the overall sample is fairly small, the companies studied in our research demonstrate that small firms vary widely in the types of HRM practices used. Thus, in spite of the importance of firm size, this variation suggests that other factors may also shape HRM practices in the organization. In particular, our findings point to the possible fruitfulness of other organizational contextual variables, including aspects of the firm's environment and strategy as explanatory factors.

Third, the lack of interrelation among the three high performance HRM practices is rather striking. For instance, companies that have developed an employer-based training program do not necessarily appraise performance on a regular basis or write out their job descriptions.

Fourth, the patterns of results in this chapter appear to support the importance of resource availability rather than external stakeholder expectations, as the primary influence on HRM practices in small firms. For instance, on the one hand, the mere existence of a CLA, which spells out some of these external stakeholder expectations by labour groups and by the Dutch government, appears to have little influence in the HRM practices implemented. Only where the CLA actually provides direct assistance on how to implement the requirement (e.g. by providing examples of written job descriptions in the case of the metal sector) does the CLA appear to predict HRM practices. On the other hand, small companies with a large company partner or associate are more apt to implement certain practices for which search and development assistance was provided. Taken together, these patterns appear to give more support to the resource-based and TCE perspectives than to institutional theory predictions. Of course, further research is needed to validate these conclusions. For instance, the current data set does not allow us to test for the impact of the three latent intermediary variables (resources, external stakeholder expectations, and the perceived value of HRM practices by the CEO). These variables might be operationalized and measured in future research to improve our understanding of the determinants of HRM practices.

Fifth, consistent with the behavioral and strategic contingency perspectives in strategic management theory, there is weak evidence that the nature of the overall competitive strategy, especially an orientation toward growth, influences the choice of certain HRM practices.

Sixth, given the wide variation in HRM practices in small companies, future research is needed to further clarify the relationships between the various HRM practices and small firm performance. Future research should validate the importance of the application of high performance HRM practices relative to firm performance.

In sum, future research on larger, randomly-drawn samples from multiple sectors is needed to test the hypotheses and tentative conclusions outlined here. Additionally, longitudinal research can provide a better understanding of the directions of cause and effect among the proposed linkages. Future research should also further examine both the organization contextual variables measured in this chapter as well as the other omitted contextual variables (including technology and culture). Nevertheless, the trends reported here suggest that the use of organizational contextual variables in addition to firm size may be a very promising line of research in efforts to predict HRM practices in smaller firms.

3.7 Conclusions

This chapter aims at the development and preliminary testing of a predictive model that explains the usage of high performance HRM practices by small firms from three different categories of organization contextual variables: firm size, strategy, and the environment. Two aspects of the environment are chosen for measurement: collective labour agreements, representing government stakeholder expectations, and the presence or absence of a large firm associate. The proposed model attempts to integrate key aspects from several theories. Results are most consistent with the predictions of the resource-based, behavioral and TCE perspective. They are least consistent with predictions drawn from institutional theory.

Our admittedly preliminary results point to a few practical implications. First, it may be more effective to stimulate the usage of high performance HRM practices by providing technology transfer assistance, than by mandating that specific practices are adhered to. In the absence of sanctions or additional resources, official mandates that communicate stakeholder expectations, as is customary with most Dutch Collective Labour Agreements, appear to have very small impact on adoption of appropriate HRM practices. Simply increasing the information about implementation in such documents (e.g. by providing examples of written job descriptions) may improve the adoption rate. Other efforts to lower search and development costs (as part of the total transaction costs) may also have a positive impact on HRM implementation. There is a general awareness that historically, government agencies and government-sponsored small business assistance programs can play an effective role in technology transfer to small companies. But results of our pilot study underscore the potential of transfer from larger private firms as well. As evidenced in our pilot results, large business partners or associates working with a large number of similar small companies (such as franchisers or supplier groups) can also provide technology transfer assistance, for HRM practices as well as other activities.

Our conclusions presume that high performance HRM practices are beneficial, and that we have a clear understanding of what they entail. However, shortcomings in definition and measurement in past research suggest the need for further validation of HRM practices in small firms, and a more careful definition of what is meant by high performance HRM practices. Hopefully future research will begin to address these issues more systematically.

Appendix 3.1: Results of qualitative analysis of selected cases

Table 3.5 Overview of selected cases

Subject	Information provided in interview
<i>Case 1</i>	
Sector	Food
Size (No. of employees)	10
Large firm associate	None
Collective Labour Agreement?	Yes
Growth orientation	Stable
HRM planning	No information
HRM recruitment	Recruit friends and family. Informal. Tried newspapers once but failed.
Selection	Employee profile must match customer profile--not too young or old.
Performance appraisal	Performance feedback 4x a year.
Compensation/benefits	No information
Training & development	Not important so not offered.
Job descriptions	No information
Team building	Once a year company trip.
Other comments	An upscale "fresh market".
<i>Case 2</i>	
Sector	Food
Size (No. of employees)	41
Large firm associate	Yes. Part of purchase group (C1000).
Collective Labour Agreement?	Yes
Growth orientation	Growth-plans to expand current location.
HRM planning	C1000 used for advice on HRM. HRM seen as part of overall strategy.
HRM recruitment	Use of job center, newspaper and shop posters.
Selection	Social skills are important. Two week trial period with two performance appraisals.
Performance appraisal	Recently added bimonthly performance feedback. If specified goals not reached, employees can be fired.
Compensation/benefits	Rewards are according to the CLA.
Training & development	Just wrote a training plan with help of C1000. Training is considered important.
Job descriptions	Yes. Taken from the CLA.
Team building	Once a year company trip.
Other comments	Owner took over 1 year ago, replaced 11 employees and changed purchasing group to C1000.

Subject	Information provided in interview
<i>Case 3</i>	
Sector	ICT
Size (No. of employees)	25
Large firm associate	Yes. IBM business partner
Collective Labour Agreement?	No
Growth orientation	Growth-Recently added a subsidiary.
HRM planning	IBM requires a quality plan with personnel policy, training plan and written job descriptions.
HRM recruitment	Various channels, including magazines, newspapers, own employees, walk-ins, and recruitment co. (last didn't help)
Selection	A test is used for programmers. The management assistant makes first cut, then the owner.
Performance appraisal	No performance feedback. Appraisal is ad hoc. It should be improved but no time is available. Results are more important than how obtained.
Compensation/benefits	Profit-sharing, competitive wages and several savings programs.
Training & development	Initiative used to be with employees. Now the employer make training mandatory. No formal career development plans.
Job descriptions	Yes. Prove a helpful tool for appraisals.
Team building	New employees are appointed to a coach. Regular company evenings and trips.
Other comments	Low turnover rate. Most employees are under 30. None are older than 50.
<i>Case 4</i>	
Sector	ICT
Size (No. of employees)	25
Large firm associate	None
Collective Labour Agreement?	No
Growth orientation	Stable.
HRM planning	No information
HRM recruitment	Recruitment via friends and acquaintances; also internet advertisement.
Selection	Selection is done by the team needing a new employee, then with the director, who decides jointly with the team.
Performance appraisal	Not done until now.
Compensation/benefits	Profit-sharing for all employees. Everyone is expected to work late at least once a week.
Training & development	Training budget but team/employees must take the initiative to follow the course. New employees must be employable right away.
Job descriptions	No information
Team building	No information
Other comments	The company wants to have as few formalised procedures as possible to avoid rigidity and inflexibility.

Subject	Information provided in interview
<i>Case 5</i>	
Sector	Metal
Size (No. of employees)	20
Large firm associate	None
Collective Labour Agreement?	Yes
Growth orientation	Growth-aim at limited growth.
HRM planning	Limited planning. The trade association is sometimes used for assistance.
HRM recruitment	Mainly uses temporary employment agencies, but only have about 3 vacancies every five years.
Selection	Skill level is an important criterion. Whether the applicant fits in the team is also important.
Performance appraisal	Only if employees perform badly. These are written down and if needed a second appraisal takes place.
Compensation/benefits	Competitive wage offered (above CLA requirements).
Training & development	Very limited training. On the job training used: Younger employees learn from more experienced colleagues.
Job descriptions	In spite of CLA regulation, the company does not yet have formal descriptions.
Team building	Team spirit is high. Most employees are loyal. Once a year company trip.
Other comments	Low quit rate. In 16 years, one employee got fired, and one left for reasons other than retirement.

Chapter 4: High performance HRM practices in small and medium-sized enterprises

4.1 Introduction

In the knowledge-based economy, companies are challenged to meet their demand for more highly trained employees in labour markets characterized by a shortage of qualified labour (Audretsch and Thurik, 2000, 2001). At the same time, the knowledge-based economy is characterized by an increasing share of small and medium-sized enterprises or SMEs (Audretsch and Thurik, 2000; Audretsch et al., 2002). Generally speaking, small firms pay less attention to human resource management than their larger counterparts do (chapter two).

Does the combination of these developments pose a threat to the success of knowledge-based economies? Our current understanding of HRM practices with SMEs is as yet insufficient to provide an answer to this question. Especially quantitative studies, in which specific hypotheses on HRM with small firms are tested empirically, are lacking.

In this chapter, we examine contextual determinants of the application of high performance HRM practices within small and medium-sized enterprises. Since it is unlikely that a single theory on organizational behaviour can ascertain all relevant determinants, we combine elements from four different theoretical perspectives on organizational behaviour: the resource-based perspective, the behavioral perspective, transaction cost economics (TCE), and the institutional approach. We present a framework on high performance HRM within SMEs, which is based on a combination of insights from these four theoretical perspectives, and builds upon the framework derived in the previous chapter (De Kok and Uhlaner, 2001).

The framework is used to derive six hypotheses on the application of high performance HRM practices within small firms. These hypotheses identify various contextual variables as determinants, including not only firm size, but also family ownership, the availability of an HRM department or HRM manager, and the existence of a formal business plan. To test these hypotheses, we use data obtained from a written survey amongst Dutch SMEs. This survey, which is discussed in the section on the research method, resulted in data on almost 700 firms with 1-500 employees. We use logistic and ordinary least-squares regressions to test the hypotheses. Our main conclusions are presented in the final section. Amongst others, we find that, within our sample of small firms, larger firms apply more high performance HRM practices than smaller firms do. However, once we take the contextual variables into account, the relationship with firm size is roughly halved.

4.2 Previous research

4.2.1 High performance HRM practices

Studies by Delery and Doty (1996), Huselid (1995), Huselid et al. (1997), Ichniowski et al. (1997), Koch and McGrath (1996) and MacDuffie (1995) show that “the more of the

high performance HRM practices that are used, the better the performance as indicated by productivity, labour turnover or financial indicators” (Guest, 1997, page 272).

High performance HRM practices refer to specific HRM practices designed to improve competences and commitment of employees. This concept includes practices such as testing of applicants, incentive pay systems, increased emphasis on workforce training and employee participation, and increased employment security. However, little consensus exists regarding a more specific demarcation of high performance HRM practices (Guest, 1997), and in each empirical study the concept is operationalised differently.

4.2.2 The role of HRM departments

According to Hendry and Pettigrew (1992), firm size will have an indirect effect on the application of high performance HRM practices. In their model of strategic change and human resource management, they differentiate between HRM context and HRM content. The context of HRM contains its role, definition, organization, and outputs. This included the presence of an HRM department or HRM manager. The HRM content includes labour flows, work systems, reward systems, and employee relations. The application of high performance HRM practices can be considered as a characteristic of the HRM content.

According to this model, the organizational context influences the HRM context, which in turn - partly - determines the HRM content. Applied to the current model, organizational characteristics may influence the presence of an HRM department or HRM manager, which is in turn a determinant of the application of high performance HRM practices. Small and medium-sized enterprises are less likely to have a specific HRM department or manager (Hornsby and Kuratko, 1990; Atkinson and Meager, 1994). This is in accordance with the finding that smaller firms apply less (high performance) HRM practices than larger enterprises.

4.2.3 A combination of theoretical perspectives

In the previous chapter, we have combined elements from various theoretical perspectives into a framework in which various contextual variables are related to the usage of high performance HRM practices. Their framework suggests four different mechanisms, along which contextual variables may influence an organization’s choice regarding the choice for high performance HRM practices. These mechanisms are represented by the following four intermediary variables:

- demand for human resources;
- supply of financial resources;
- expectations and requirements from external stakeholders;
- the CEO’s perceived value of HRM practices.

The rationale for these intermediary variables is based on insights from the resource-based perspective of the firm, the behavioral perspective, the institutional approach and transaction cost economics (TCE).

Both the resource-based perspective and the behavioral perspective points towards the demand for human resources as intermediary variable in our model. The choice for high performance HRM practices results from the demand for human resources (both in terms of quantity and quality). This, in turn, depends on the corporate strategy. Other

contextual dimensions (organizational size, environment and culture) may influence organizational strategy, and thus, indirectly, the demand for human resources. Alternatively, they may influence the demand for resources directly. Institutional theorists view organizations as entities that gain legitimacy and stakeholder acceptance by conforming to these stakeholders' expectations for behavior.

Some have argued that TCE can be of help in gaining a better understanding of differences among small firms. Using the TCE perspective, Nooteboom discusses the special case of the small firm in detail (Nooteboom, 1993). For small firms, "the perspective from which external scanning is performed is often dominated, and thereby restricted, by the personal perspective of the entrepreneur" (Nooteboom, page 289). Bounded rationality thus points towards the importance of theories on entrepreneurship, to explain the heterogeneity in HRM practices with small and medium-sized enterprises. The attention of the entrepreneur for the management of human resources, and thus his or her perceived value of HRM practices, may be related to various contextual dimensions.

The main contribution of TCE to our framework is threefold. Firstly, we have included the perceived value of HRM practices by CEOs as an intermediary variable. The importance of the perceived value by CEOs as a determinant of the usage of high performance HRM practices is a direct result of their bounded rational behavior. Secondly, the usage of high performance HRM practices may depend upon the supply of financial resources within the firm. Thirdly, TCE focuses our attention on the role that external stakeholders may play, by reducing the costs of introducing and applying certain high performance HRM practices.

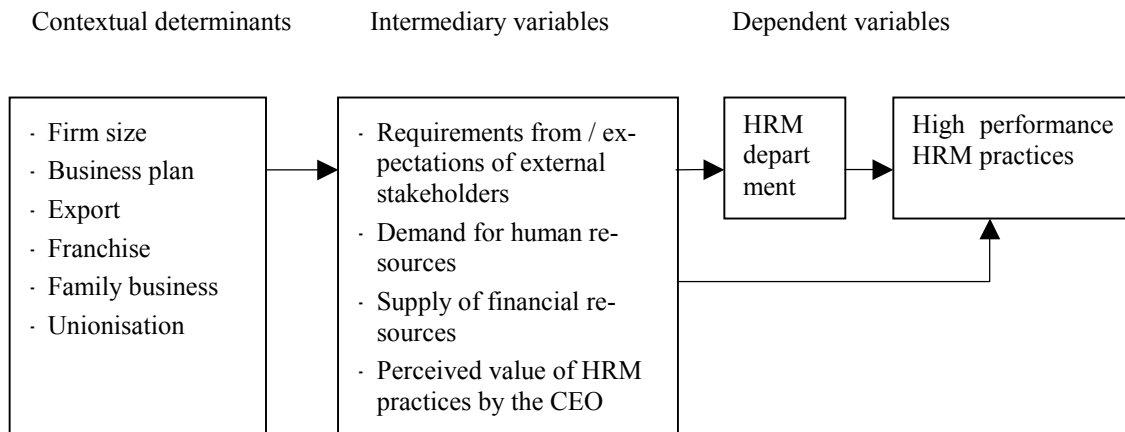
4.3 High performance HRM practices within small firms

4.3.1 A framework of organizational contextual determinants of HRM within small firms

The theoretical perspectives discussed in the previous section can explain how the application of high performance HRM practices depends upon four intermediary variables: the demand for human resources, the supply of financial resources, the expectations and requirements from external stakeholders, and the CEO's perceived value of HRM practices (Figure 4.1). Following Hendry and Pettigrew (1992), the HRM practices include both the presence of an HRM department (or manager) and the usage of high performance HRM practices. The impact of the intermediary variables on the usage of high performance HRM practices may therefore be both direct and indirect.

We focus on HRM practices rather than HRM strategy. Our first argument for this focus is that firms without specific strategies may still apply certain practices. Secondly, similar HRM strategies may result in different practices to realize those strategies, depending on contextual differences. Consequently, we do not investigate whether or not a specific HRM strategy exists. Nor do we investigate to which extent the HRM practices are internally consistent (resulting in an internal fit) or integrated with the overall business strategy (which represents an external fit).

Figure 4.1 A framework of contextual determinants of HRM practices within small and medium-sized enterprises



The intermediary variables are, in turn, determined by an organization's structural and contextual dimensions. In this chapter, we focus on contextual dimensions. Firm size is a contextual dimension of its own, and one of the contextual determinants in this chapter. Goals and strategy of an enterprise, also a contextual dimension, are more difficult to measure. The presence of a business plan is used to indicate whether the goals and strategies are made explicit. Two other indicators of this contextual dimension concern specific strategic choices: the choice to export, and the choice to associate with a franchise organization.

Another contextual determinant is family business. A family business is defined as a business that is not only owned by members of one family, but also managed by members of this family. It indicates a specific aspect of the relationship of an organization with its environment: the ownership relationship. Since family ownership may stimulate the notion of the company-as-extended-family (Legge, 1995), this variable may also be seen as an indicator of culture. In addition, the culture of organizations is represented by the degree of unionization.

4.3.2 Hypotheses

We are now able to derive our hypotheses. We will concentrate on the contextual determinants since intermediary variables are not available.

Firm size

Several arguments can be made to expect a positive relationship between firm size and the usage of high performance HRM practices.

First of all, if the number of employees increases, so does the need to decentralize and communicate between employees and departments. This, in turn, requires a higher level of standardization, specialization and formalization (Daft, 1998; Nooteboom, 1993). In addition, an increase of the number of employees results in an increasing demand for HRM practices regarding recruitment, selection, performance appraisal etc. The combination of these two developments indicates that larger firms are faced with a higher de-

mand for standardized and formalized HRM practices than smaller firms are. Consequently, larger firms would benefit more from departments and / or employees that have specific knowledge and expertise on the implementation of such HRM practices. Larger firms are, therefore, more likely to have an HRM department or HRM manager than smaller firms. This relationship is confirmed by previous studies (Hornsby and Kuratko, 1990; Atkinson and Meager, 1994). In turn, the presence of such a department or manager will have a positive impact on the application of high performance HRM practices (this relationship will be elaborated at the end of this section).

Large firms may benefit from scale effects in the usage of high performance HRM practices, even when an HRM department or HRM manager is absent. This suggests that firm size also has a direct effect on the usage of high performance HRM practices.

Furthermore, most high performance HRM practices require considerable development costs (Klaas et al., 2000). This results in a cost advantage for larger firms, which is strengthened by the limited supply of financial resources of many small firms. Finally, requirements from external stakeholders will also differ between small and large firms: legislation is often differentiated by size class.

These arguments are in line with a behavioral perspective on HRM practices: larger firms apply more high performance HRM practices than smaller firms, because larger firms benefit more from such practices than smaller firms would. In contrast, the best practice approach suggests that high performance HRM practices are equally beneficial for small and large firms. The usage of such practices may be lower for smaller firms than for larger firms, if small firms are more bounded in their rationality.

To conclude, we hypothesize the existence of a direct effect of firm size on the usage of high performance HRM practices, as well as an indirect effect through the presence of an HRM department or manager. The relationship between the presence of an HRM department and high performance HRM practices is discussed at the end of this section; here, we state the first hypothesis of this chapter as follows:

H4.1: Firm size is positively related with the usage of high performance HRM practices and the probability of having an HRM department or HRM manager.

Business plan

The availability of a business plan can be interpreted as a characteristic of organizations with a relatively long planning horizon. These firms will be more aware of the need to use specific HRM practices to build a competent employee base, implying a relatively high perceived value of HRM practices by the CEO. In addition, the availability of a business plan may be seen as an indicator for enterprises that have a relatively high degree of formalization. Both cases support the following hypothesis:

H4.2: Organizations with a business plan are more likely to apply high performance HRM practices and are more likely to have an HRM department or HRM manager.

Export

Growth-oriented strategies may result in a greater emphasis on professional HRM development (De Kok and Uhlaner, 2001; Lengnick-Hall and Lengnick-Hall, 1988). Tha-

kur (1998) concludes in a case-based research study of several Indian establishments that companies with a goal of new venture growth tend to have more professional HRM practices. Matthews and Scott (1995) find in a study of 130 small firms that entrepreneurial firms (defined as those aiming at higher growth) engage in more sophisticated planning than small firms in general; although they find that as the perception of environmental uncertainty increases, strategic and operational planning decrease. Exporters by definition are aiming for growth growth by seeking new markets outside the boundaries of their own countries. We therefore hypothesize that:

H4.3: Organizations that export are more likely to apply high performance HRM practices and are more likely to have an HRM department or HRM manager.

In addition, exporting may indicate a relatively long planning horizon of the organization. Exporting often involves additional administrative burdens and getting acquainted with legal and other requirements in other countries. The willingness to overcome these specific difficulties and start-up costs suggests a relatively long planning horizon, which can lead to an increased awareness of the importance of HRM.

Franchise

We posit that a franchise organization can help the franchisees to reduce the transaction costs associated with development of more formalized HRM practices. Franchisees may gain access to relevant HRM programs from the larger franchiser. This lowers the development costs.

H4.4: Franchisees are more likely to apply high performance HRM practices than non-franchisees.

We do not hypothesize a relationship with the probability that an HRM department or manager is present. On the one hand, the expectations of franchisors may stimulate franchisees to install an HRM department. On the other hand, the availability of external HRM expertise with the franchisor may reduce the need for a separate HRM department with the franchisee.

Family ownership

Family ownership implies, that the selection of the CEO is not (solely) based on his or her skills to manage a small or medium-sized enterprise. Consequently, the management of a family-owned business is less likely to have the necessary management skills, and more specifically to have knowledge on (the benefits of) high performance HRM practices. Also, family ownership is associated with a desire to remain independent and keep full control over the organization (Blais and Toulouse, 1990; Bacon et al., 1996). Case-studies suggest that employers often associate high performance HRM practices with a loss of control over (and flexibility of) the employee relations (Koch and De Kok, 1999).

These arguments suggest that the perceived value of HRM practices may be relatively low for CEO's of family-owned business. This results in the following hypothesis:

H4.5: Family businesses are less likely to apply high performance HRM practices and are less likely to have an HRM department or HRM manager.

Unionization

For the US, several studies have found relations between unionization and HRM practices with medium-sized enterprises (Deshpande and Flanagan, 1995; Flanagan and Deshpande, 1996; Ng and Maki, 1993). For the Netherlands, such a relationship is not likely to exist. This is due to the institutional context, which has a profound influence on the shape of human resource management (Boselie et al., 2001). For example, approximately 800 collective labour agreements (CLAs) have been signed in the Netherlands, which frequently contain requirements for high performance HRM practices (Rojer and Pulleman, 2000). Whether or not a small firm falls under a specific CLA is independent of the unionization degree. In addition, every organization with more than 50 employees is legally obliged to install a works council, which has various legal rights. Consequently, we have no clear-cut idea about the impact of the degree of unionization on the usage of high performance HRM practices in Dutch firms, and therefore do not specify a hypothesis.

HRM department

The presence of an HRM department or HRM manager may be associated with a higher level of relevant knowledge and experience in HRM practices, which decreases the costs of carrying out those practices. In addition, once an HRM department is available, certain fixed costs have been made. Consequently, the (marginal) costs of developing and /or applying more formal HRM practices are lower. Also, HRM professionals may be biased in favor of formal HRM practices because this enhances their status within the organization (Ng and Maki, 1993). Our final hypothesis is therefore:

H4.6: Organizations with an HRM department or HRM manager are more likely to apply high performance HRM practices.

4.4 Research method

We use logistic and ordinary least-squares (OLS) regressions to test the formulated hypotheses. Logistic regressions are used to examine determinants of the probability that organizations have an HRM department or HRM manager, and OLS is used to examine which independent variables are related to the usage of high performance HRM practices. The analysis results are presented in the following section. This section discusses the collection of the necessary data, and the variables used in the analyses.

4.4.1 Sample and data collection

Data has been collected by means of a written questionnaire, sent to Dutch small and medium-sized enterprises. The questionnaire has originally been developed by the University of Southern Queensland, Australia (Wiesner and McDonald, 2001). A first version of the questionnaire has been submitted to a sample of 70 Australian SMEs, 31 of which responded. The results of this pilot have been used to modify the questionnaire. Subsequently, it has been submitted to several senior academics on HRM for their comments. The revised questionnaire has been translated and controlled by Dutch HRM researchers and practitioners.

A stratified sample plan is used, distinguishing six sectors (manufacturing, construction, trade and repairs, catering, transport and communication, services) and three size classes (20-49 employees, 50-99 employees and 100-199 employees). 4000 questionnaires have been sent, addressed to the company's CEOs. 736 questionnaires were received, 52% of which has been answered by the CEO, 33% by an employee directly answering to the CEO. With 18%, the response rate of our survey is higher than those mentioned by Koch and McGrath (1996) (6.5%) and Heneman and Berkley (1999) (12%), but lower than for example those reported by Huselid (1995) (28%) and Golhar and Deshpande (1997) (52%).

Not all respondents fall within the stratified size classes. 100 Enterprises have either less than 20 employees, or 200 or more. To avoid the loss of 100 observations, we have decided to apply the Small Business Administration definition of SMEs (Flanagan and Deshpande, 1996), and include all enterprises with 1 to 500 employees in our analysis. In Table 4.1, the firms that are included in our analysis are described by sector and size class.

Table 4.1 **Sampled enterprises, by sector and size class**

Sector	Size class (number of employees)					Total
	1-20	21-50	51-100	101-200	201-500	
Manufacturing and construction	10	69	86	67	11	243
Trade and repairs	6	24	32	21	6	89
Transport, communication and services	31	91	97	57	15	291
Other	3	16	28	22	3	72
Total	50	200	243	167	35	695

With such relatively low response rates, sample selection bias may become a problem. To check for sample selection bias by size and sector, we compare the response rates for the 18 strata of our sample. For 10 strata, the response rate lies between 16% and 20%. The two largest response rates are 27% and 22%, the two lowest are 14%. This suggests that there is no serious sample selection bias by size or sector. Whether selection is biased by the respondent's attitude towards HRM cannot be determined.

The questionnaire contained, amongst others, 12 items on recruitment practices, 12 items on selection methods and procedures, 12 items on compensation, 14 items on training and development and 8 items on appraisal. Each of these items is measured on a 3-point scale (no, for some vacancies/jobs, for all vacancies/jobs). A list of all items can be found in appendix 4.1.

4.4.2 Measures

Scales on the application of high performance HRM practices

We have developed a single scale on high performance HRM practices that represent the usage of such practices: the more high performance HRM practices are used, the higher the score on the HRM scale. The rationale for this scale is based upon previous studies, which suggest a positive relationship between this scale and various performance measures (Guest, 1997). In addition, separate scales measure the usage of high performance HRM practices for specific categories of HRM practices. This allows us to de-

termine the correlation between the usage of high performance HRM practices of various categories, and to examine if the relationship between firm size and the usage of high performance HRM practices differs between categories. The following categories are included: recruitment, selection, compensation, training & development and appraisal.

The items on the various HRM practices are combined to construct a separate scale for each category. More specifically, each scale is defined as the average score of a selection of the available items¹⁹. The selected items all represent high performance HRM practices, hence the scale is interpreted as an indicator of the number of high performance HRM practices in that specific HRM category that are applied within the enterprise. To determine the reliability of these scales, Cronbach's alpha is calculated for the selected items. In addition, factor analysis is performed on all items, and the correlation between the main factor(s) and the scale is calculated²⁰. The average scores, percentiles and reliabilities of all scales are presented in Table 4.2.

Table 4.2 Scores and reliability statistics on scales of high performance HRM practices

	Scale				
	Recruitment	Selection	Compensation	Training & development	Appraisal
<i>Score</i>					
Mean	1.6	2.0	1.8	1.7	2.0
10% percentile	1.3	1.5	1.3	1.0	1.3
90% percentile	2.0	2.8	2.2	2.3	2.7
<i>Reliability</i>					
Cronbach's alpha	.62	.69	.64	.81	.43
Correlation PCA factor	.94	.85 ^a	.97	.93	.91
Valid observations	533	619	621	669	598

a: Principal Component Analysis (PCA) identified more than 1 factor. The table presents the correlation with the factor that has the highest correlation with the scale.

note: all scales are defined on the interval [1,3].

For four of the five scales, Cronbach's alpha exceeds .60 (Table 4.2). According to criteria proposed by Nunnally (1967)²¹, the reliability for these scales is acceptable for an explorative study. The reliabilities of these scales are comparable with those reported by e.g. Huselid (1995) and Delery and Doty (1996). The exception is appraisal. With a Cronbach's alpha of .43, the reliability of this scale is unsatisfactory. Given the importance of this scale, we nevertheless decide to include it in this chapter.

¹⁹ The selected items are discussed in appendix 4.1.

²⁰ Three different methods of factor analysis have been applied: a principal component analysis (PCA), a principal axis analysis and a categorical PCA (which explicitly takes account of the ordinal nature of the items). We report only the correlations with the PCA factor, but the correlations with the factors determined according to the other methods are nearly identical.

²¹ For early stages of basic research, Nunnally (1967) suggested that a Cronbach's alpha between .5 and .6 would be sufficient. Later on, Nunnally (1978) suggested a lower boundary of .7.

None of the scales can be calculated for all firms. This introduces the risk of a selection bias. To determine whether such a bias may occur, we examine for each scale whether the respondents to that scale significantly different in their average scores on a number of variables compared to the non-respondents²². No significant differences in firm size are found between respondents and non-respondents. What does matter, is the position of the respondent within the organization. For CEO's, the response rate is significantly lower than for other respondents²³. This holds for all scales, with the exception of the recruitment scale. A possible explanation for this finding is that the CEO takes less time to fill in the complete questionnaire.

In addition, if the questionnaire is answered by the CEO, the average score on HRM scales is relatively low. The differences are however small, and only significant (at a 5% confidence level) for recruitment, selection, and training and development. It is not clear whether this represents a "genuine" CEO effect, since the probability that the questionnaire is filled in by the CEO decreases with firm size. The position of the respondent will therefore be included as a control variable in the regressions.

An overall HRM scale

The overall HRM scale is calculated as an unweighted average of the underlying scales for the separate HRM categories. The resulting overall HRM scale is defined for 519 enterprises. A Cronbach's Alpha of .78 suggests that this is a reliable scale. The response rate for this overall HRM scale is significantly lower for smaller firms, for CEO's, and for members of a franchise organization.

HRM department

Firms were asked whether an HRM department and an HRM manager were present. These questions have been used to construct a variable "HRM department". This variable indicates whether an HRM department or an HRM manager is present.

Independent variables

The independent variables used in this chapter are presented in Table 4.3. In addition to the variables discussed in the previous section, we also include information on organizational age and sector to control for possible effects these variables may have.

²² These control variables are size, sector, current working position of the respondent, location of the firm, current tenure of the respondent, whether the respondent is (part) owner, whether the company is owned by a family, whether the enterprise is member of a franchise organization, if a business plan is available, and the respondent's gender.

²³ The response rate is also lower if the respondent has a long tenure with the firm, or is (part) owner of the firm. Since ownership, tenure and being CEO are strongly related with each other, these differences in response rate are interpreted as confirmations of the CEO-effect.

Table 4.3 **Independent variables**

Variable name	Definition
Size	Log (number of employees), including employees with temporary contracts; no correction for part-time work
Business plan ^a	A formal business plan or strategic plan exists
Export ^a	Enterprise exports
Franchise ^a	Enterprise is part of a franchise organization
Family ^a	Family business, defined as both owned and managed by member(s) of one family
Unionization	% of employees that is member of a union (classified into 7 categories)
Union member ^a	At least one employee is member of a union
Age	Log (age of enterprise)
Service ^a	Enterprise is (mainly) active in transport and communications, catering, financial services, business services or other services
Trade ^a	Enterprise is (mainly) active in wholesale, retail or repairs sector
Manufacturing ^a	Enterprise is (mainly) active in manufacturing or construction sector

a: dummy variable (0=no, 1=yes).

4.5 Results

We now turn towards the results of our analysis. After a discussion of the correlations, multivariate analyses are used to test the hypotheses presented section 4.3.

4.5.1 Correlation analysis

All correlations between the dependent variables are significantly positive (Table 4.4). The overall HRM scale is strongly correlated with the various scales on the individual HRM categories. The correlations between the various HRM scales (excluding the overall HRM scale) do not, however, exceed .55. This suggests that it is worthwhile to examine these scales individually, instead of limiting ourselves to the overall HRM scale. Correlations between independent variables do not exceed .35, with the exception of the correlations between the sector dummies, and between union membership and unionization (Table 4.5). The latter two variables are both indicators of the unionization within organizations, which explains the high correlation between them.

Table 4.4 Correlations between dependent variables (HRM scales and HRM department)

		1	2	3	4	5	6	7
Recruitment	1	1						
Selection	2	.45	1					
Compensation	3	.43	.42	1				
Training & development	4	.52	.51	.38	1			
Appraisal	5	.33	.43	.37	.43	1		
Overall HRM scale	6	.70	.79	.68	.78	.72	1	
HRM department	7	.40	.38	.26	.33	.22	.43	1

note: all correlations are significant at 1% confidence level.

Firm size is correlated with most independent variables. Smaller enterprises are more likely to be family owned and managed, and to be found in the service sector. Larger enterprises are older, more likely to have a business plan, have on average a higher degree of unionization, and are more likely to export.

Table 4.5 Correlations between independent variables

	1	2	3	4	5	6	7	8	9	10	11	
Size	1	1										
Business plan ^a	2	.25**	1									
Export ^a	3	.10**	.06	1								
Franchise ^a	4	-.01	-.00	-.11**	1							
Family ^a	5	-.27**	-.24**	-.08*	.05	1						
Unionization	6	.13**	.07	.09*	-.10**	-.03	1					
Union member ^a	7	.14**	.03	.09*	-.04	-.02	.62**	1				
Age	8	.11**	-.03	.06	-.20**	.06	.17**	.16**	1			
Service ^a	9	-.11**	-.02	-.32**	.03	.00	-.19**	-.14**	-.13**	1		
Trade ^a	10	.00	-.03	.09*	.17**	-.00	-.16**	-.07	.05	-.33**	1	
Manufacturing ^a	11	.08*	.04	.25**	-.12**	.01	.29**	.17**	.07	-.62**	-.28**	1

*: significant at 5% level.

**: significant at 1% level.

a: dummy variable. The relationship between two nominal variables is measured by the Phi coefficient. For dummy variables, the Phi coefficient is identical to Pearson's correlation.

Fisher's exact test is used to test for dependency between two dummy variables.

In hypothesis H4.6, the presence of an HRM department is an explanatory variable. Correlations between the variable “HRM department” and the independent variables are presented in appendix 4.2. The presence of an HRM department is especially correlated with firm size (.41) and family business (-.29). Family businesses are less likely to have an HRM department, as are smaller organizations. Since family owned businesses tend to be smaller, simple bivariate correlations do not suffice to determine whether the presence of an HRM department is determined especially by family ownership, or by other size-related variables. Multivariate analyses are needed to answer this question.

4.5.2 Determinants of the probability of having an HRM department

According to hypotheses H4.1, H4.2, H4.3 and H4.5, the presence of an HRM department is related with firm size, the availability of a business plan, export, and family ownership. To put these hypotheses to the test, logistic regression equations have been estimated, with the probability of having an HRM department as the independent variable. A full version of the regression equation included all independent variables²⁴. According to the regression results, the variables franchise, union member, age, export, trade and manufacturing were not related to the presence of an HRM department²⁵. The regression equation has therefore been reestimated, including only size, business plan and family ownership (Table 4.6).

Table 4.6 Results of logistic regression on probability that HRM department is present

Variable	HRM department ^d
Size	1.11**
Business plan	.44*
Family	-.75**
<i>Goodness of fit measures</i>	
% predicted correctly ^a	69.8
R ² (Nagelkerke)	.27
Chi ² test for model parsimony ^b	10.96 (.09)
Chi ² test for model fit ^c	136** (.00)
Valid observations	615

*: significant at 5% level.

**: significant at 1% level.

a: the reference value is 54,8%: the share of firms in the sample with an HRM department.

b: test for the joint hypothesis that the parameters for franchise, union member, age, export, service and trade are equal to zero. Probability value between parenthesis.

c: test for the hypothesis that all included parameters (except constant) are equal to zero. Probability value between parenthesis.

d: the significance of the parameters is based upon both Wald statistics and Likelihood Ratio test statistics. Both test statistics lead to the same conclusions. A constant term has been estimated, but is not included in the table.

The regression results indicate that hypotheses H4.1, H4.2 and H4.5 are accepted. Both smaller firms and family owned and managed organizations are, *ceteris paribus*, less likely to have an HRM department. The availability of a business plan is associated with an increased probability of having an HRM department. Whether an organization exports or not, is not related to the presence of an HRM department; hypothesis H4.3 is not accepted. No specific hypothesis regarding franchise organizations and unionization

²⁴ Where the degree of unionisation is represented by the variable union member. In addition, regressions included a dummy variable indicating the position of the respondent (owner/manager or not), to control for a possible answer bias. This control variable had no significant impact in any of the regression equations discussed in this section.

²⁵ A chi² test for model parsimony cannot reject the joint hypothesis that the parameters of the excluded variables do not differ significantly from zero.

has been made. The results of our analysis indicates that the presence of an HRM department is independent of any association with a franchise organization, and of the degree of unionization.

4.5.3 Determinants of the application of high performance HRM practices

A regression of firm size on the various HRM scales results in significant positive relationships (Table 4.7). The size of these relationships differs between the HRM scales. The strongest relationship can be found between firm size and the scale on high performance training & development practices, the weakest relationships between firm size and the scales on high performance compensation and appraisal practices.

Table 4.7 Results of ordinary least squares regressions on scales of high performance HRM practices

	Scale					
	Recruitment	Selection	Compensation	Training & development	Appraisal	Overall HRM scale
Size	.15** (.02)	.18** (.02)	.08** (.02)	.22** (.02)	.12** (.03)	.15** (.02)
Adjusted R ²	.16	.09	.03	.15	.04	.15
Valid observations	474	545	548	582	529	461

*: significant at 5% level.

**: significant at 1% level.

note: reported parameter estimates include standard errors (between parenthesis); a constant term has been estimated, but is not included in the table.

Once the other independent variables are included (Table 4.8), the strength of the relationship between firm size and the HRM scales decreases. The relative differences between the HRM scales remain intact: firm size has the strongest impact on the training & development scale, and the weakest impact on the compensation and appraisal scales. The relationship between firm size and these two scales is not even significant, which rejects hypothesis H4.1 for the compensation and appraisal scales. Indirectly, however, these scales are still related with firm size: firm size is positively related with the probability that an HRM department is present, which in turn stimulates the usage of high performance HRM practices for all HRM categories.

With the exception of recruitment, the availability of a business plan has a positive effect on the usage of high performance HRM practices. Hypothesis H4.2 is therefore accepted for all scales, except recruitment. Exporting firms apply relatively many high performance recruitment and selection practices, but no difference is found regarding the usage of high performance practices regarding compensation, training & development and appraisal. Hypothesis H4.3 is nevertheless accepted for the overall HRM scale. Hypothesis H4.4 is rejected for all scales but one. Franchise organizations apparently stimulate the training and development of the personnel of their franchisees, but do not encourage the application of high performance HRM practices in other HRM categories. Family businesses are less likely to apply high performance HRM practices, even if we control for firm size and the availability of an HRM department. This is in accordance with hypothesis H4.4.

Table 4.8 Results of ordinary least squares regressions on scales of high performance HRM practices

	Scale					
	Recruitment	Selection	Compensation	Training & development	Appraisal	Overall HRM scale
HRM department	.12** (.03)	.21** (.04)	.12** (.03)	.11** (.04)	.12** (.04)	.13** (.03)
Size	.10** (.02)	.06* (.02)	.01 (.02)	.14** (.02)	.05 (.03)	.07** (.02)
Business plan	.04 (.03)	.20** (.04)	.11** (.03)	.17** (.04)	.14** (.04)	.13** (.03)
Export	.09** (.03)	.13** (.04)	.06 (.03)	.01 (.04)	.08 (.05)	.08** (.03)
Franchise	.00 (.05)	-.02 (.07)	-.02 (.06)	.24** (.07)	.06 (.08)	.09 (.05)
Family	-.08** (.02)	-.19** (.04)	-.12** (.03)	-.19** (.03)	-.14** (.04)	-.14** (.02)
Unionization	-.03** (.01)	.01 (.01)	-.03* (.01)	.01 (.01)	.00 (.02)	-.01 (.01)
Age	-.01 (.01)	.05** (.02)	.01 (.01)	.00 (.02)	-.03 (.02)	.00 (.01)
Trade	-.10** (.04)	.04 (.05)	.05 (.04)	-.04 (.05)	-.04 (.06)	-.01 (.04)
Manufacturing	-.02 (.03)	.02 (.04)	.12** (.03)	.08* (.04)	-.04 (.05)	.04 (.03)
Adjusted R ²	.29	.28	.15	.27	.11	.35
Kolmogorov-Smirnov ^a	0.04* (.03)	.05** (.01)	.02 (.20)	.03 (.20)	.05** (.00)	.04 (.11)
Breusch-Pagan ^b	23.5** (.01)	4.7 (.91)	10.9 (.37)	33.6** (.00)	8.8 (.55)	12.7 (.24)
Valid observations	474	545	548	582	529	461

*: significant at 5% level.

**: significant at 1% level.

a: Kolmogorov-Smirnov test for normality of the residuals. Reported significance level based on the Lilliefors significance correction.

b: Breusch-Pagan test statistic for homoscedasticity, following a chi-squared(10) distribution. note: reported parameter estimates include standard errors (between parenthesis), reported goodness of fit measures include probability values (between parenthesis); a constant term has been estimated, but is not included in the table.

The presence of an HRM department is expected to have a positive relationship with the usage of high performance HRM practices (hypothesis H4.6). This hypothesis is accepted for all scales, and the magnitude of this relationship is similar for all scales (with

the exception of selection)²⁶. The relationship between the presence of an HRM department and the usage of high performance HRM practices partly reflects indirect effects of firm size, family ownership and the availability of a business plan (Table 4.6). We may therefore expect that a re-estimation without the variable “HRM department” will increase the parameter estimates for the variables firm size, family and business plan. This is indeed the case. This suggests that part of the impact of family ownership and firm size on high performance HRM practices is channeled through the presence of an HRM department or HRM manager.

We have not formulated a specific hypothesis on the impact of unionization. The results from Table 4.8 tell us, that unionization has a limited negative effect on the usage of high performance recruitment and compensation practices. The negative relationship with compensation could indicate a reluctance of union members towards performance based compensation schemes. A higher degree of unionization could correspond to a higher share of union members in the workers council, which could in turn influence management’s decisions regarding the nature of the compensation scheme. The degree of unionization has, however, no significant effect on the overall usage of high performance HRM practices.

The remaining independent variables are not related to overall usage of high performance HRM practices. Elder organizations seem to apply relatively more high performance selection procedures than younger enterprises, but otherwise, organizational age is not related with the usage of high performance HRM practices. Sectoral differences are found for recruitment, compensation and training and development practices.

Outliers

Generally speaking, firms with an HRM department make more use of high performance HRM practices. There are, of course, exceptions to this rule. On the one hand, some firms without an HRM department use relatively many high performance HRM practices. And, on the other hand, several firms with an HRM department make relatively little use of such practices. To test these “outliers” for common characteristics, we have defined two outlier categories, “high” and “low”. The category “high” contains 21 firms without an HRM department, whose score on the overall HRM scale lies within the highest quartile. Similarly, the category “low” consists of 38 enterprises with an HRM department, whose score on the overall HRM scale lies within the lowest quartile.

Logit regressions are performed to examine which, if any, of our independent variables, determines the classification of these outliers (Table 4.9). Generally speaking, logit regressions are not suitable if less than 20% of the population belongs to the category of interest. In this case, however, the logit analysis results in significant parameter estimates. For both models, χ^2 tests for model fit reject the hypothesis that all model parameters are zero.

The outliers are not characterized by their size. Family ownership and management increases the possibility of being a “low” outlier, while manufacturing and construction

²⁶ We cannot be sure that this represents a causal relationship; it could also indicate the impact of a specific HRM strategy on both the availability of an HRM department and on the formality of HRM practices.

companies are relatively less likely to belong to this category. At the other end of the spectrum, several of the organizations classified as “high” outliers report that they export. We have controlled for a respondent bias: if the respondent is owner/manager the organization is more likely to be classified as “high”. The inclusion of the respondent’s position in our analysis does, however, not alter our conclusions. Bivariate comparisons of the variables involved support these results. The average firm size does not differ significantly between the outliers and the rest of the sample. And Fisher’s exact test statistics confirm the relations between family ownership, manufacturing and the “low” outliers, and between export and the “high” outliers.

The outlier analysis confirms some of our previous findings. Family businesses are less likely to have an HRM department, but after we correct for the impact of HRM department on the usage of high performance HRM practices, there still exists a negative effect of family business on high performance HRM practices. On the other hand, firms that export apply relatively many high performance HRM practices, even though exporting is not related to the presence of an HRM department. These findings are consistent with the relations between family business, export and the probability of being an outlier.

Table 4.9 Results of logistic regressions on outliers (low and high)

	Outliers	
	Low	High
Family	.85*	
Manufacturing	-1.27**	
Export		1.12*
<i>Goodness of fit measures:</i>		
% predicted correctly ^a	92%	96%
R ² (Nagelkerke)	.07	.04
Chi ² test for model parsimony ^b	9.6 (.21)	11.8 (.16)
Chi ² test for model fit ^c	14.2 (.00)	5.64 (.02)
Valid observations	466	466

*: significant at 5% level.

**: significant at 1% level.

a: the reference values are 92% and 96% respectively: the share of firms that are classified as “low” and “high” respectively.

b: test for the joint hypothesis that the parameters for all independent variables not included in the model are equal to zero. Probability value between parenthesis.

c: test for the hypothesis that all included parameters (except constant) are equal to zero. Probability value between parenthesis.

note: a constant term has been estimated, but is not included in the table. the significance of the parameters is based upon both Wald statistics and Likelihood Ratio test statistics. Both test statistics lead to the same conclusions.

4.6 Discussion

The results presented in this chapter are in line with previous research. The positive relationship between firm size and high performance HRM practices has been demonstrated before, amongst others by Barron et al. (1987). They estimate regression equa-

tions, and find that smaller firms pay less attention to high performance recruitment and training practices. They do not, however, correct for contextual variables. Only one explanation is offered for the firm size effect: larger firms are hypothesized to have higher employee monitoring costs, which prompts them to increase the capital intensity of their production process and stimulate long tenure. Although this may partly explain the size effects, differences in monitoring costs are just one of many possible explanations.

The explanations offered in this chapter explain at least half of the size effect of the usage of high performance HRM practices: for the overall HRM scale, the introduction of the contextual determinants in the regression equation has almost halved the impact of firm size, and more than doubled the explained variance²⁷. The main contextual determinants are the presence of an HRM department or manager, the availability of a business plan, and whether or not the business is family owned and managed.

With the exception of training and development practices, the application of high performance HRM practices is independent of being a franchisee or not. In addition, franchisees are just as likely to have an HRM department or HRM manager as other small and medium-sized organizations. This confirms the findings from the previous chapter on the relationship between being associated with other (larger) organizations and HRM practices.

Deshpande and Flanagan (1995), Flanagan and Deshpande (1993) and Ng and Maki (1993) conclude that the degree of unionization in U.S. and Canadian enterprises is an important determinant of HRM practices with medium-sized enterprises. For the Netherlands, we find only partial support for such relations: the degree of unionization is negatively related to the usage of high performance recruitment and compensation practices. These differences may be due to differences in national legislation (Boselie et al., 2001).

Organizational age and the usage of high performance HRM practices do not seem to be closely related. Only for selection practices do we find a positive relationship between organizational age and high performance HRM practices. This conclusion is comparable to the results by Heneman and Berkley (1999), who examine determinants of the outcomes of recruitment and selection practices. Four different outcome indicators are distinguished in their study, and organizational age is related to only one of these. Delery and Doty (1996) include organizational age as a control variable, and find that it is correlated with three of the seven distinguished HRM practices.

4.7 Conclusions

The primary purpose of this chapter is to examine and explain differences in the usage of high performance HRM practices within small firms. We have presented a framework on contextual determinants of HRM practices, which we use to derive and test six hypotheses regarding determinants of both the presence of an HRM department or an HRM manager, and the usage of high performance HRM practices.

²⁷ As measured by the adjusted R^2 .

We find that, *within this sample of small firms*, larger firms make more use of high performance HRM practices than smaller firms do. This firm size effect may be due to unmeasured differences in the degree of centralization, standardization and specialization between small and large firms. Firm size is often used as an indicator for these structural dimensions, and firm size effects are interpreted as a sign for the relevance of these dimensions. We find, however, that at least half of the firm size effect in our sample can be explained by contextual dimensions. Once we take certain contextual determinants into account, the firm size effect becomes substantially less, and even insignificant for the usage of high performance compensation and appraisal practices. Family owned and managed organizations apply less high performance HRM practices, as do businesses without a business plan. These businesses are also less likely to have an HRM department or HRM manager. The presence of an HRM department or manager is related to an increased usage of high performance HRM, which implies that firm size, family business and the availability of a business plan are both directly and indirectly related to the usage of high performance HRM practices.

According to contingency theories of HRM, the impact of high performance HRM practices on firm performance will depend on various contingency variables. Although we have examined the role of firm size and other contextual determinants, we cannot conclude whether these variables are important contingency variables. This would require an empirical investigation into the relationship between high performance HRM practices and firm performance.

Ownership seems to be an unlikely contingency variable; it is unlikely that the impact of high performance HRM practices on firm performance depends, *ceteris paribus*, on whether or not a business is owned and managed by members of a single family. The relevance of family business is more likely to reflect differences in goals, attitudes and abilities of the management of the enterprise.

The number of employees is a more likely contingency variable. While larger firms may benefit from an increased usage of high performance HRM practices, small firms may actually benefit from more informal HRM practices. Large firms are more likely to standardize their tasks, and formalization of HRM practices will allow them to be more efficient in recruiting, selecting and maintaining employees with the right qualifications for given tasks and positions. Small firms, on the other hand, could create jobs around the unique experience, knowledge, skills, and interests of both incumbent and newly hired employees, which requires a more flexible and less formalized HRM (Hill and Stewart, 1999). This strategy is also called “serendipitous” job design (Lado and Wilson, 1994).

Different explanations have been discussed to support our hypotheses, referring to different perspectives on organizational behavior. These explanations are reflected by the intermediary variables of our model: requirements from external stakeholders, demand and supply of resources, and the perceived value of HRM practices by the CEO. The relative importance of the various explanations cannot be established, since no information on these intermediary variables is available. In addition, we cannot answer the question whether the firm size differences reflect differences in optimal HRM practices, or that smaller firms are more likely to make suboptimal differences due to a more bounded rationality. To answer this question, future research is needed to examine relations between HRM practices and performance for small firms, using firm size as a contingency variable.

Appendix 4.1: Scales on high performance HRM practices

This appendix provides additional information on the HRM scales that are used in this chapter. The HRM scales are based on the available items in the questionnaire. Each of these items is measured on a 3-point scale (no, for some vacancies/jobs, for all vacancies/jobs). For each HRM scale, the scope of the available items is discussed by comparing the items with high performance HRM practices discussed in descriptive studies on HRM. We use Sisson (1994) as a reference regarding recruitment, selection, compensation and appraisal practices. We indicate which items are used in the definition of each scale, and discuss the correspondence with the results of factor analysis on all items. Three different methods of factor analysis have been applied: a principal component analysis (PCA), a principal axis analysis and a categorical PCA (which explicitly takes account of the ordinal nature of the items). The outcomes of these analyses are almost identical; in this appendix, we only report the PCA results.

Recruitment

Firms are asked about the usage of various channels to recruit new employees. The items in the questionnaire include all relevant recruitment channels for external recruitment that are discussed in Sisson (1994). Internal recruitment is excluded from our research (Table 4.10).

The recruitment scale is defined as the average score on seven selected items, for those firms that answered at least 6 of the 7 items. Both factor analysis and Cronbach's alpha indicated that the most often used recruitment channel (newspapers) should not be included in this scale. Various items in the scale have a low response rate (130-180 missing values). This results in a low response rate for the recruitment scale: it is defined for only 533 firms, by far the lowest response for all scales.

Table 4.10 Recruitment items in questionnaire

Item	Used in scale	Factor matrix factor 1
Recruitment and selection office	x	0.60
Temporary employment agencies	x	0.42
Magazines	x	0.58
Internet	x	0.63
Referrals by employees	x	0.47
References from other sources	x	0.47
Open house	x	0.50
Newspaper		
Government employment agency		
Radio		
Television		
Direct mail		
Cronbach's Alpha (only for the scale)	0.62	
Eigenvalue (only for the factor)		2.43
valid observations	533	502

note: factor loadings of .4 and larger are reported.

PCA on the available items results in four independent factors with an eigenvalue larger than 1. A scree plot of the eigenvalues suggests, however, only one factor. Factor loadings of .4 and larger are reported in Table 4.10

Selection

Firms are asked about the selection procedures, and the involvement of managers and employees in the selection decision. We focus on the selection procedures for new employees. These selection procedures include the collecting and ordering of data, opinions and inferences on which the decision will be based. Sisson (1994) mentions six methods of collecting information about candidates. Four of these are included in the questionnaire; only letters of application and assessment centers are not included. The most important sources for the final decision, references and interviews (Sisson, 1994, page 213), are included in our questionnaire (Table 4.11).

Table 4.11 **Selection items in questionnaire**

Item	Used in scale	Rotated factor matrix			
		1	2	3	4
<i>Items on selection procedures</i>					
Use of written job descriptions	x	0.77			
Job analysis	x	0.72			
Psychological tests	x	0.62			
Interview panels	x		0.65		
Formal selection procedures		0.69			
One-on-one interviews			-0.88		
Application forms				0.56	
Checking up on references				0.75	
Informal selection procedures				0.59	0.50
<i>Items on selection decision</i>					
Selection decision made by line manager		0.45			
Other managers and employees have input in selection design					0.70
Other employees have input in selection decision					0.67
Cronbach's Alpha (only for the scale)	0.69				
Eigenvalue (only for the factor)		2.56	1.40	1.33	1.51
Valid observations	619	554	554	554	554

note: a varimax rotation procedure has been used.

note: factor loadings of .4 and larger are reported.

A PCA confirms the difference between selection procedures and the selection decision. Four factors are identified with an eigenvalue of at least 1, of which three mainly refer to selection procedures, and one to the selection decision. Focusing on the factors that concern the selection procedures, the first factor included items that are correlated with what employers consider to be formal selection procedures. The second factor measures the preference of organizations for interview panels relative to one-on-one interviews.

The remaining items on selection procedures (the usage of application forms and checking up on references) load on a factor which is related to what employers consider to be informal selection procedures.

The selection scale is based on the first factor (the correlation between the scale and the first factor is 0.85). Since the usage of interview panels is considered to be a high performance HRM practice, this item has been included in the scale. The item “formal selection procedures” is excluded from the scale, because no definition of “formal selection procedures” was presented to the respondents. The item “selection decision made by line manager” has been removed, since we limit ourselves to the selection procedure.

Compensation

Sisson (1994) distinguishes three criteria on compensation decisions that are used in practice: behavioral traits of employees, skills and competences, and output. All of these criteria are included in our questionnaire.

The compensation scale is defined as the average score on nine selected items, for those firms that answered at least 8 of the 9 items. PCA on the available items results in four independent factors with an eigenvalue larger than 1. A scree plot of the eigenvalues suggests, however, only one factor. Factor loadings of .4 and larger are reported in Table 4.12

Table 4.12 Compensation items in questionnaire

Item	Used in scale	Factor matrix factor 1
Performance pay	x	0.43
(Partly) based on job evaluation	x	0.54
Competitive wages	x	0.50
Wages based on acquired skills	x	0.54
Group incentive programs	x	0.53
Individual incentive programs	x	0.58
Profit sharing	x	0.47
Annual bonus	x	0.55
Additional financial benefits, other than pensions (for example, insurance and savings arrangements)	x	0.41
Pay based on seniority		
Employee share schemes		
Salary structures used		
Cronbach's Alpha (only for the scale)	0.64	
Eigenvalue (only for the factor)		2.56
Valid observations	621	573

note: factor loadings of .4 and larger are reported.

Training and development

The items on training and development include not only questions on firm-provided training, but also on the use of specific training tools (computer-aided instruction), on on-the-job training, and on coaching and mentoring of employees. We focus on characteristics of firm-provided training programmes.

The scale is defined as the average score on seven selected items, for those firms that answered at least 6 of the 7 items. PCA on the available items results in three independent factors with an eigenvalue larger than 1. Again, a scree plot of the eigenvalues suggests only one factor. Most items in the questionnaire have factor loadings of .4 and larger on this factor (Table 4.13). Items that are not related to firm-provided training (such as training on the job, specific training tools, mentorship and introduction of new career paths) are, however, excluded from the scale.

Table 4.13 Training and development items in questionnaire

Item	Used in scale	Factor matrix factor 1
Training provided to employees		0.48
Formal training budget available	x	0.62
Recent introduction of formal training programs	x	0.69
Recent intensification of existing training programs	x	0.68
Formal in-house training by internal staff	x	0.57
Formal in-house training by external staff	x	0.59
External training	x	0.40
Management and development training	x	0.65
Technical and vocational training		
Informal training on the job		0.55
Introduction of new career paths		0.70
Informal mentorship		0.45
Formal mentorship		0.47
Computer-aided instructions		0.47
Cronbach's Alpha (only for the scale)	0.76	
Eigenvalue (only for the factor)		4.33
Valid observations	598	531

note: factor loadings of .4 and larger are reported.

The original items in the questionnaire have only been answered by firms that provided training to their employees. To increase the number of valid observations, we have recoded missing values for the other items as “no”, for those firms that reported that no training was provided to their employees. This has added 72 valid observations to this scale, and increased Cronbach's Alpha from 0.76 to 0.81. The item whether any training has been provided to employees is left out of the scale, since the answer to this item is now included in the answers to the other items (if all items included in the scale report “no”, the firm has not provided any training to their employees).

Appraisal

Appraisal “includes all those formal processes for observing, collecting, recording, and using information about the performance of staff in their jobs” (Sisson, 1994, page 230). Performance is typically appraised in one of three ways: trait scales, behavioral observation scales or objective outcome measures. Our questionnaire includes questions on rating scales and management by objectives, but no items on objective outcome measures. This category of HRM practices is least well covered in our questionnaire.

The appraisal scale is defined as the average score on three selected items. PCA on the available items results in two independent factors with an eigenvalue larger than 1. A scree plot of the eigenvalues suggests either one or two factors. Given the limited number of available items, the one-factor solution is preferred, and factor loadings of .4 and larger for the one-factor solution are reported in Table 4.14

Table 4.14 Appraisal items in questionnaire

Item	Used in scale	Factor matrix factor 1
Rating scales	x	0.71
Management by objectives	x	0.61
Appraisal conducted by line manager	x	0.55
Formal performance appraisal systems used		0.77
Based on narrative essay by employees		0.43
Appraisal conducted by employee		excluded ^a
Appraisal conducted by employee's colleagues		excluded ^a
Informal performance appraisal		-0.01
Cronbach's Alpha (only for the scale)	0.43	
Eigenvalue (only for the factor)		1.96
Valid observations	598	557

a: excluded from the analysis, due to a large number of missing observations (220).

note: factor loadings of .4 and larger are reported.

Overall HRM scale

The overall HRM scale is calculated as an unweighted average of the underlying scales on high performance HRM practices. Other possibilities are to calculate the overall HRM scale by an unweighted average of the scores on the individual items, or using a principal axis factoring on the individual scales. Correlations between these scales and the scale presented here are .98. This implies that the overall HRM scale is very robust, in that the score on the overall HRM scale doesn't depend on the exact methodology used to define the scale.

A disadvantage of this method is the limited number of valid observations (411). To increase the number of valid observations, the separate scales have been recalculated, allowing for an (additional) missing item for each scale. This results in a further 108 valid observations. The factor scores for the adjusted HRM scales are reported in Table 4.15.

Table 4.15 The overall HRM scale defined

HRM scale (adjusted)	Factor matrix factor 1
Recruitment	0.75
Selection	0.78
Compensation	0.70
Training and development	0.78
Appraisal	0.68
Cronbach's Alpha (of the scale)	0.78
Eigenvalue (of the factor)	2.72
Valid observations (for both scale and factor)	519

note: factor loadings of .4 and larger are reported.

Appendix 4.2: Correlations between dependent and independent variables

Table 4.16 Correlations between dependent and independent variables

	Dependent variables: HRM scales and HRM department						
	Recruit- ment	Selec- tion	Compen- sation	Training & development	Appraisal	Overall HRM scale	HRM de- partment
Size	.41**	.32**	.19**	.41**	.20**	.41**	.41**
Business plan ^a	.21**	.34**	.23**	.34**	.20**	.35**	.22**
Export ^a	.16**	.21**	.17**	.10*	.08	.19**	.12**
Franchise ^a	-.04	-.06	-.06	.08*	.02	.03	-.06
Family ^a	-.32**	-.35**	-.26**	-.35**	-.22**	-.40**	-.29**
Unionization	-.07	.12**	-.01	.09*	.01	.03	.05
Union member ^a	-.01	.18**	.02	.06	.09*	.06	.10**
Age	-.04	.10*	.00	-.02	-.07	-.03	-.01
Service ^a	.05	-.07	-.17**	-.06	.03	-.06	.00
Trade ^a	-.10*	-.00	.00	-.02	-.02	-.04	-.03
Manufacturing ^a	-.04	.06	.12**	.08	-.04	.06	-.03

*: significant at 5% level.

**: significant at 1% level.

a: dummy variable. The relationship between two nominal variables is measured by the Phi coefficient. For dummy variables, the Phi coefficient is identical to Pearson's correlation. Fisher's exact test is used to test for dependency between two dummy variables.

Chapter 5: Absenteeism and precautionary actions

5.1 Introduction

Absenteeism results in considerable costs, both for individuals, firms and governments. For the EU member states, the total annual cost for medical care, daily allowances, and present and future compensation for cases of permanent disability and death is estimated at approximately 20 billion euro per year (Eurostat, 2000). For individual organizations, the main cost of absenteeism is due to production losses (and continued wage payments). For example, within the Dutch private sector, 5.5% of all working days in 2000 were lost due to absenteeism²⁸.

Absence spells are usually classified in one of the following three categories: certificated sickness absence, absence due to accidents and absence for other reasons (non-certificated absences, strikes etc.)²⁹. Employees report absent either because they feel they are unable to work (due to sickness or accidents), or because they choose not to work (Brown and Sessions, 1996). Most economic studies focus on the latter explanation; absenteeism is treated as a labour supply adjustment by employees. This chapter looks into the first explanation: absence due to sickness or accidents.

Within the European Union, over 4.5 million accidents took place in 1996 that resulted in more than three days absence from work. A considerable number of these accidents was fatal: about 5500 people were killed in workplace accidents (Eurostat, 2000). According to the European Commission, absence due to sickness and accidents can be reduced by precautionary actions that improve working conditions (European Agency for Safety and Health at Work, 2000b). This chapter focuses on the possibility for individual firms to reduce absence due to sickness or accidents, by taking precautionary actions to improve working conditions.

Recently, policy makers start to pay attention to absenteeism due to sickness and (occupational) accidents. In the Netherlands, financial incentives have been introduced to stimulate enterprises to change their behaviour regarding prevention and reintegration of employees (Brouwers et al., 2000). The European Agency for Safety and Health at Work has started an information campaign aimed at reducing the number of work-related accidents (European Agency for Safety and Health at Work, 2000a). The focus of this campaign is on organizations with less than 50 employees. The reason for this focus is that the majority of all accidents³⁰ take place within this size class. These firms account for more than half³¹ of total employment within the European Union (European Commission, 2000). Moreover, while the overall absenteeism rate is known to increase

²⁸ According to Statline, the on-site database from Statistics Netherlands, available at www.cbs.nl.

²⁹ A fourth category that is sometimes distinguished is absence on a legal or contractual basis. This includes absence due to annual leave, maternity leave, or death in the family (Boon, 2000; Prins, 1990). This category is not related to the health status of employees, and usually ignored in studies on absenteeism.

³⁰ Resulting in absence spells of more than 3 days.

³¹ 53% in 1998.

with firm size (Boon, 2000), the individual risk of having an accident at work³² is higher for establishments with less than 50 employees (Eurostat, 2000).

Individual enterprises may implement precautionary actions to reduce the probability that individual employees become absent. The main benefit of such actions is related to the reduction in actual absence rates. This can be compared with the cost of implementing precautionary actions. Often, firms are not aware of the actual benefits and costs, and will compare expected benefits and costs instead. These expected benefits and costs depend on many factors, including the actual absence level, current legislation and whether or not employers believe that working conditions within their firm are related to the absence level.

In this chapter we examine which factors determine whether Dutch enterprises take precautionary actions. We focus on Small and Medium-sized Enterprises (SMEs), since the majority of accidents takes place within this size class. In section 5.2 we discuss various perspectives from which absenteeism may be studied, and the relationship between absenteeism and precautionary actions. This information enables us to delineate the research question of this chapter. Section 5.3 presents some facts on absenteeism with SMEs. In 5.4, six hypotheses are derived that characterize an organisation's decision whether or not to take precautionary actions. These hypotheses are tested empirically; section 5.5 presents the research method, and the results are given in section 5.6. The main conclusion, which is included in section 5.7, is somewhat surprising: whether or not employers believe that the working conditions within their firm are related to the absence level, has no impact on the actual decision of those employers regarding precautionary actions.

5.2 Various perspectives on absenteeism

Absenteeism has been studied from various perspectives. This section presents relevant findings from previous studies, both conceptually and empirically. At the end of this section, these findings are used to delineate the research question.

5.2.1 *A psychological and economic perspective on absenteeism*

Within studies of determinants of absence behaviour, two main perspectives can be distinguished: the economic and the psychological perspective (Barnby et al., 1991).

Within the psychological literature, several explanatory models of absenteeism have been developed (Geurts, 1994). An influential model has been developed by Steers and Rhodes (1978). According to this model, attendance of employees is determined by the motivation to attend and the ability to attend. The ability to attend depends on the incidence of illness and accidents, family responsibilities and transportation problems. The motivation to attend has however received most attention from this line of research. Job motivation, employee satisfaction and employee participation are considered to be important determinants of absenteeism (Boselie et al., 2001; Brooke and Price, 1989; Deery et al., 1995; Havlovic, 1991).

³² Resulting in an absence spell of more than 3 days.

The same emphasis on the motivation to attend can be found within economic literature. Absenteeism is commonly treated as a deliberate labour supply adjustment of workers dissatisfied with the number of contracted working hours (Brown and Sessions, 1996; Yaniv, 1995). The main difference with the psychological literature is the focus on financial arrangements to influence the motivation to attend. According to economic studies, absence levels can be partly explained by wages and sick pay schemes (Barmby et al., 1991; Barmby et al., 1994; Barmby et al., 2002; Kenyon and Dawkins, 1989).

Recently, economists are paying attention to demand side factors also. Absenteeism may be more costly for some firms than for others, due to differences in production technologies and complementarities between workers. Consequently, firms for which absenteeism is more costly may offer higher wages. Coles and Treble (1996) establish an equilibrium framework in which firms who require better attendance rates at work pay higher wages, in order to reduce the absence level. Again, wages affect absenteeism levels, but in this framework firms take account of this behaviour and set their wages accordingly.

Both approaches only consider working conditions, insofar as these may influence the motivation to attend. In this article we focus on precautionary measures, as a means to increase the ability to attend.

5.2.2 An employee's perspective on sickness absence behaviour

In the case of sickness or accidents, the incidence and duration of absence spells depends upon both the ability and the motivation to attend. An employee is confronted with a sequence of events and health or work-related decisions he or she has to make. This decision-making process has been examined by Prins (1990). His model of sickness absence behaviour consists of four different roles that employees can assume³³:

- Healthy employee role. The individual's constitution, and health problems ranging from minor ailments to serious disease, may be seen as the major determinant of an individual's general state of health. Three factors can be discerned which can influence the state of health: personal conditions, living conditions and working conditions (including occupational status, shift work, risk of accidents, social relations, and stress).
- Sick role. If the individual feels sick, he or she seeks and receives treatment to restore health or to stop the progression of the disease.
- Dependent patient role. This role starts with reporting sick and is in some countries formalised by certification of the work incapacity through medical evaluation.
- Permanent absence role. Most spells of sickness absence are completed by resumption of the employee role. A minority of frequently or long term sick may (be forced to) substitute the dependent-patient role for the permanent absence role: a status as a disabled, unemployed or retired person.

³³ The labels "healthy employee role" and "permanent absence role" do not occur in the original study.

The decision to change from one role to another depends on specific thresholds:

- The sickness tolerance threshold. This standard defines whether and when the experience of symptoms makes the individual decide to assume the sick role with its role expectations (attempts to obtain diagnosis, treatment, and restoration of health).
- The absence tolerance threshold. This indicates when the individual (or his environment) considers himself released from the duty to attend work. If this is the case, the sick role will be exchanged for the dependent patient role. If not, the individual accepts the health complaints and continues to attend to work.
- The work resumption threshold. This threshold indicates the conditions likely to terminate the dependent patient role and allow resumption of work. Alternatively the employee role is terminated and another branch of social security may be entered.

5.2.3 Absenteeism and precautionary measures

Absenteeism is known to be related with working conditions within organizations. Poor physical working conditions (such as an overexposure to heat, dust, gasses or noise, or unsafe working conditions) and ergonomic shortcomings are associated with higher absence rates (Geurts, 1994; Prins, 1990). The relationship between mental working conditions and absenteeism is less straightforward. On the one hand, Geurts (1994) and Huczynski and Fitzpatrick (1989) find that continuing high levels of job stress lead to an increase of absenteeism. On the other hand, a literature review by Houtman et al. (1999) reports mixed results on empirical research into stress and absenteeism. Jacobson et al. (1996) find that work stress is the most important source of high stress levels, but it is not related to actual levels of absence (while other sources of stress are).

Practices aimed at reducing absenteeism can be classified into monitoring, absenteeism support and precautionary measures. Monitoring and absenteeism support are primarily aimed at reducing the length of absenteeism spells, whilst precautionary measures aim at reducing the number of absence spells. Precautionary measures include adaptation of tasks or workplace, promotion of personal protective gear use, and instruction of employees to improve the tackling of in-company health hazards (Brouwers et al., 2000). Research on absenteeism and working conditions suggests, that precautionary actions can reduce absenteeism due to occupational causes (Havlovic, 1991). Bertera (1990) finds that absence not due to occupational causes can also be reduced by specific company policies. Health promotion activities focusing on smoking cessation, fitness, weight control, lipid control, stress management, and healthy back result in a reduction of absenteeism levels (Bertera, 1990, page 1101).

5.2.4 The research question delineated

We are now able to delineate the context of this chapter. Absenteeism is determined by employee's motivation and ability to attend. An increased ability to attend will result in lower levels of absenteeism due to sickness and accidents. Organizations can stimulate the ability to attend, by taking precautionary actions to improve the health status of employees. The research question of this chapter is which factors determine whether SMEs take precautionary actions to improve the ability to attend.

5.3 Absenteeism with small and medium-sized enterprises

5.3.1 Overall absenteeism

On average, small firms have lower absence levels than large firms (Barmby and Stephan, 2000; Boon, 2000; Coles and Treble, 1996; Wilson and Peel, 1991). This may be explained by differences in the motivation to attend. Various authors argue that employees with smaller firms are more motivated, which increases the absence tolerance threshold and reduces the work resumption threshold. Some authors point towards the lack of bureaucracy and specialization as a source for this behavioural advantage of small firms (Nooteboom, 1993; Daft, 1998). Others argue that within smaller firms, the relationship between individual and organizational performance is clearer (Bacon et al., 1996; Storey, 1994).

These explanations focus on the relationship between firm size and employee behaviour. Other explanations are based on the behaviour of employers. Lower absence levels may be caused by lower monitoring costs for smaller firms (Barron et al., 1987), resulting in fewer possibilities for shirking. Alternatively, the equilibrium framework by Coles and Treble (1996) suggests that the equilibrium level of absenteeism may differ between small and large firms. Firms for which absenteeism is more costly will offer higher wages in order to limit the absence rates. In addition, they will hire reserve workers to guarantee a minimum amount of available labour. In this equilibrium framework, an increase in firm size requires a less than proportional increase in the number of reserve workers, because risks can be diversified among more workers (Barmby and Stephan, 2000; Coles and Treble, 1996). Consequently, larger firms can insure against (the consequences of) absenteeism at lower costs, and hence their equilibrium absence level is higher.

5.3.2 Occupational accidents

The overall level of absenteeism is positively correlated with firm size. For the specific category of occupational accidents, the relationship is however opposite: the risk of having an occupational accident is higher within smaller establishments than in larger ones (Eurostat, 2000; Storey, 1994)³⁴. According to Eurostat (2000), employees working in establishments with 10-49 employees are faced with an annual probability of having an accident (resulting in more than 3 days absence) of 5.2% (Eurostat, 2000). This is substantially higher than the 2.9% for employees working in establishments with at least 250 employees.

Also, the nature of accidents (resulting in major injuries) differs between size classes. Storey (1994) presents findings concerning the UK manufacturing industry in 1989. For establishments with 100 or more employees, the main category of accidents is slip, trip or fall (27% of all accidents). For establishments with less than 100 employees, this category contains 12% of all accidents. Accidents involving contact with moving machinery are the main category for this size class, accounting for almost 30% of all re-

³⁴ This implies that for absence due to other causes (i.e. sickness and non-health related causes), the correlation between absence rate and firm size is even more positive than for the overall absence rate (assuming that the average length of an absence spell due to an occupational accident is independent of firm size).

ported accidents. This would reflect “poor training, less experienced operators, and generally less well-guarded machinery in smaller establishments” (Thomas, 1991, as cited by Storey, 1994).

5.3.3 *Knowledge and attitudes on absenteeism*

Between 1996 and 1999, changes in the Dutch social security legislation have introduced financial incentives to change enterprise behaviour regarding absenteeism. Brouwers et al. (2000) investigate to which extent this has led to an increased focus on reducing absenteeism, amongst enterprises with less than 100 employees. Their findings first of all suggest, that smaller firms have in general less knowledge on health-related topics than larger organizations. For example, smaller firms were less informed about the legislative changes than larger firms. In addition, smaller firms are less likely to believe they can exert any influence on absence levels: 32% of firms with 1-9 employees are of the opinion that they can exert no influence at all on absence rates, versus 8% of firms with 50-99 employees.

Secondly, the results of Brouwers et al. (2000) indicate that the identification of a relationship between working conditions and absenteeism may be a determinant of precautionary actions. Organizations that consider themselves to be able to influence their absence rates, are more likely to have increased their focus on reducing absenteeism³⁵. In addition, 47% of the firms that increased their focus mentioned improved knowledge of in-company health hazards as an important reason for doing so³⁶. Another determinant of precautionary actions is firm size: larger firms are more likely to have increased their focus on reducing absenteeism³⁷.

5.4 Determinants of precautionary measures

What are the determinants of precautionary actions? Not much is known about which factors influence the decision of individual firms to implement precautionary actions. The study by Brouwers et al. (2000) suggests, that the available knowledge on this topic may be an influential factor. This suggestion is elaborated in this chapter. We focus on the opinion of employers, whether or not working conditions are related to the absence level within their firm. On the one hand, we examine the effect of this opinion: to which extent does it influence the implementation of precautionary actions. On the other hand, we look at possible explanations for this opinion.

5.4.1 *Implementing precautionary measures*

When will firms decide to take precautionary actions? A standard neoclassical approach to this problem would be to assume a rational acting firm, which performs a cost/benefit

³⁵ An increased focus on reducing absenteeism refers to various activities, such as adaptation of tasks or workplace, promotion of personal protective gear use, instruction of employees to improve the tackling of in-company health hazards and an improved coaching of ill employees.

³⁶ Other often mentioned reasons include financial motives (69%) and an increased importance attached to staff health (56%).

³⁷ Controlling, amongst others, for the extent to which organizations believe they can exert influence on absence levels and for sectoral differences.

analysis. This firm is completely and correctly informed of all relevant costs and benefits. The firm would take precautionary actions, only if the benefits of precautionary actions exceed the costs.

In this chapter, we use another framework to analyse the decision-making process of an individual firm. We assume that firms behave in a bounded rational manner. Employers are willing to make a rational decision, but their knowledge of alternatives and consequences is prey to cognitive limitations, and they often lack the motivation to conduct the necessary information searches (Legge, 1995). In addition, small firms have a more limited capacity for the acquisition of relevant knowledge than larger firms. Consequently, rationality is more bounded for these firms (Nooteboom, 1993). Employers may have certain expectations regarding costs and benefits of precautionary actions, but there is no guarantee that these expectations are anywhere near the actual costs and benefits.

The expected benefits of precautionary measures will depend strongly on the expected effect of these measures on the level of absenteeism within the organization. In general, improving the working conditions within organizations will lower the absence levels. However, if measures are not implemented well, or if absenteeism levels are already low, it may be difficult for individual firms to recognise this relationship. Thus, we may expect that some employers are aware of this relationship, while others see no relationship between the working conditions and the (current and future) levels of absenteeism within their company. We expect that if employers don't identify this relationship, they are less likely to take precautionary actions to improve working conditions. This is formalised in the first hypothesis:

H5.1: organizations that identify a relationship between working conditions and absenteeism, are more likely to take precautionary measures.

In addition, we hypothesise that small firms are less likely to take precautionary measures, even if they assume that working conditions and absenteeism are related:

H5.2: larger organizations are more likely to take precautionary measures.

The rationale behind this second hypothesis is that precautionary actions may be (relatively) more costly for smaller firms. This may be due to a lack of knowledge and/or manpower to implement certain practices. In addition, certain practices may have considerable fixed costs, which increase the costs per employee for smaller firms.

5.4.2 Identifying a relationship between working conditions and absenteeism

According to hypothesis H5.1, the probability of taking precautionary measures depends upon the identification of a relationship between working conditions and absenteeism. This identification will in turn depend on other factors. Some of these factors will be related to characteristics of the employer, for example educational level, experience, and knowledge on absenteeism (and human resource management related topics in general). We hypothesise that, in addition, the opinion of the employer is related to the employer's assessment of the working conditions:

H5.3: organizations that assume that working conditions are demanding for a larger share of employees, are more likely to identify a relationship between working conditions and absenteeism.

If employers consider working conditions to be demanding for a larger share of employees, they are more likely to consider those working conditions as one of the determinants of absenteeism.

The share of employees for which working conditions are thought to be demanding can, in turn, depend upon reported health problems by employees. This implies an indirect relationship between reported health problems and the identification of a relationship between working conditions and absenteeism. Reported health problems may also have a direct effect upon the identification of this relationship: if (virtually) no health problems are reported, it is likely that such a relationship will not be identified, irrespective of the share of employees for which the tasks are considered to be demanding.

Indicators for reported health problems include health complaints by employees and the absence level. The role of reported health problems is captured by the following two hypotheses:

H5.4: organizations with more health complaints by employees, are more likely to identify a relationship between working conditions and absenteeism.

H5.5: organizations with higher absence rates, are more likely to identify a relationship between working conditions and absenteeism.

Reported health problems (both health complaints by employees and absence rates) thus are assumed to have an indirect effect on the probability that precautionary actions are taken³⁸. If health problems are reported, but not associated with an identification of the relationship between working conditions and absenteeism, they are supposed to have no effect on the probability that precautionary actions are implemented.

Finally, we hypothesise that the probability of identifying a relationship between working conditions and absenteeism increases with firm size (controlling for differences in employer's assessment of working conditions and reported health problems):

H5.6: larger organizations are more likely to identify a relationship between working conditions and absenteeism than smaller organizations.

This hypothesis is based on the assumption that small firms may be more bounded in their rationality than large firms, due to a more limited capacity for the acquisition and processing of relevant knowledge (Nooteboom, 1993). Consequently, small firm employers may *ceteris paribus* be less likely to identify a relationship between working conditions and absenteeism than employers with larger firms.

³⁸ If precautionary actions are taken, these are supposed to reduce the absence level. This implies a dynamic interaction between absence levels and precautionary actions. It is beyond the scope of this study to examine this interaction. Precautionary actions are treated as a dependent variable only.

5.5 Research method

The hypotheses derived in the previous section will be tested empirically. Logistic regressions will be used to estimate the probabilities of taking precautionary actions, and of identifying a relationship between working conditions and absenteeism. The regression results are presented in the next section. In this section we discuss sample and data collection, and the variables used in the regressions.

5.5.1 *Sample and data collection*

The data for the research presented in this chapter was collected by means of telephonic interviews amongst Dutch establishments with less than 200 employees³⁹. The interviews were held in 1995, before the most recent changes in Dutch legislation (discussed in Brouwers et al., 2000). A stratified sample plan was used to ensure that all relevant sectors and size classes were adequately represented in the sample. The stratification plan distinguished six sectors (manufacturing, construction, trade and catering, transport, financial and business services and other services) and five size classes (1-9 employees, 10-19, 20-49, 50-99 and 100-199). 900 establishments were called, asking for the manager in charge. 609 interviews were completed, 579 of which by establishments with less than 200 employees (a response rate of 64%). 41% of these interviews had been held with the owner and/or manager in charge, 28% with a personnel officer. The majority of the participating establishments were independent organizations, 174 establishments were part of a larger organization.

5.5.2 *Dependent variables*

Two dependent variables are distinguished. The first dependent variable is “measures”, which records whether or not precautionary measures have been taken (in 1994) to improve physical and mental working conditions. The second dependent variable is “identification”. This variable represents the opinion of the respondent regarding the relationship between working conditions and actual absence levels. It contains the answer to the question whether or not the physical and mental working conditions within the establishment are believed to partly determine short- and long term absenteeism and/or outflow of employees. Besides being a dependent variable (see hypotheses H5.3-H5.6), “identification” is also an explanatory variable of “measures” (see hypothesis H5.1).

Average scores of these variables are presented in Table 5.1, both overall and by size class. As expected, larger establishments are more likely to identify a relationship between working conditions and absenteeism, and to have taken precautionary measures. The results from Table 5.1 show that identification is not a necessary condition for taking precautionary measures. While 37% of all enterprises has taken precautionary measures, only 18% has identified a relationship between working conditions and absenteeism. This might be explained by the obligatory status of many precautionary measures (for example, wearing safety helmets on construction sites). Another explanation could be that many respondents think no connection exists between current working conditions and current absenteeism, because of precautionary measures taken in the past.

³⁹ The complete questionnaire (in Dutch) is included in Bosch and De Kok (1997).

Table 5.1 Inquiry results by size class

	Size class (number of employees)			
	1-9	10-49	50-199	Total ^c
<i>Dependent variables:</i>				
Working conditions determine absenteeism and/or turn-over (identification) ^a	9	19	48	18
Precautionary measures taken (measures) ^a	28	46	72	37
<i>Independent variables:</i>				
Employees with physically demanding work ^b	47	48	49	47
Employees with mentally demanding work ^b	38	31	32	36
Employees reporting physical complaints ^a	13	27	53	17
Employees reporting stress ^a	4	9	31	6

a: % of establishments.

b: % of employees.

c: weighted average, representing average per establishment.

5.5.3 Independent variables

An important explanatory variable for both dependent variables is establishment size, which is represented by the natural log of the number of employees. Other explanatory variables include indicators of:

- the employer's opinion as to which extent the working conditions are demanding for employees;
- health complaints by employees;
- absenteeism within the establishment.

The first two items are measured by two variables each. The variables "physically demanding work" and "mentally demanding work" represent the share of employees for which respondents consider the work to be physically or mentally demanding. Next, the variables "physical complaints" and "stress" indicate whether or not employees (i.e. more than 1) have reported to experience physical complaints or stress. Average scores for these variables are presented in Table 5.1.

The assessment of the share of employees for which working conditions are demanding does not vary much with establishment size. On average, respondents report that 47% of the employees within their establishment has physically demanding work, while 36% has mentally demanding work. In contrast, the share of employers who receive health complaints is strongly correlated with size. For example, employees have reported stress within 4% of establishments with 1-9 employees, and within 31% of establishments with 50-199 employees.

This difference is partially caused by the measurement scales. "Physically demanding work" and "mentally demanding work" report percentages of employees (within establishments), while the variables on health problems are dichotomous. Even if the probability that individual employees report health problems is the same for small and large establishments, the probability that more than one employee within an establishment would report such problems increases with size.

Reported health problems are positively correlated with firm size. This is true not only for reported health complaints, but also for reported absence levels (Table 5.2). Two out of every three establishments with less than 200 employees claim their absence rate (including maternity leave) is below 2%. On the other hand, 5% of all establishments report that more than 10% of all working days are lost due to absenteeism.

Table 5.2 Annual absence rates 1994, including maternity leave, by size class

Absence rate (% of working days lost due to absence)	Size class (number of employees)			
	1-9	10-49	50-199	Total ^a
0-1	76%	33%	6%	67%
2-4	15%	39%	40%	19%
5-6	3%	12%	25%	5%
7-8	0%	8%	18%	2%
9-10	1%	4%	9%	2%
>=11	6%	5%	2%	5%

a: weighted average, representing average per establishment.

note: due to rounding errors, column totals may not add to 100%.

The self-reported rates presented in Table 5.2 may be compared with average absence rates reported in Statline, the on-line electronic databank from Statistics Netherlands (www.cbs.nl). For 1994, Statline reports average absence rates (including maternity leave) of 3.9% for enterprises with 1-9 employees, 4.5% for enterprises with 10-99 employees and 6.5% for enterprises with 100 or more employees. The Statline statistics differ from Table 5.2 both in the distinguished size classes and in the unit of observation (enterprises versus establishments). Still, the information from Statline suggests that the establishments in our sample underestimate or underreport their absence levels⁴⁰.

The absence rate is positively correlated with the proportion of workers for whom the physical working conditions are considered to be demanding. The correlation between absence rate and the variable “mentally demanding work” does not differ significantly from zero⁴¹.

In the regression analyses, the seven categories presented in Table 5.2 are reduced to three categories (0-1%, 2-6% and >= 7%). This has been done to increase the number of observations within each category (in addition, it increases the parsimony of the equations to be estimated). Several additional variables are included in the analysis, to control for systematic variance that cannot be attributed to the variables of interest in this chapter. These include indicators for the independence of the establishment, whether or not risks within the company have been inventoried and evaluated (RI&E)⁴², whether the establishment falls under a collective labour agreement, whether the establishment is member of a trade organization, the presence of a workers council, if the respondent is the employer or not (where employer is defined as being owner or manager in charge),

⁴⁰ Alternatively, our sample may not be representative for the Dutch private sector.

⁴¹ At a 5% significance level.

⁴² Since 1994, Dutch companies are obliged to make an inventory of occupational risks for their employees, develop a program to reduce these risks, and evaluate this program. This process is known as the RI&E. Although the RI&E was obliged at the time of the inquiry, only 56% of the respondents were aware of this obligation.

the financial position of the establishment, and the fraction of employees aged 45 years or above. The correlation between firm size and having a workers council is .56; otherwise, correlations between the variables discussed in this section do not exceed .5.

5.6 Results

In section 5.4, we derived six hypotheses that are assumed to characterise the decision making process of small and medium-sized enterprises. In this section, logistic regressions are used to test these hypotheses. Notice that the hypotheses are tested on data from establishments rather than independent organizations. We will refer to this problem in the second part of this section, where we discuss the results. First, we turn to the regressions.

5.6.1 Determinants of precautionary actions

We start with an examination of the probability that establishments identify a relationship between working conditions and absenteeism within their firm. Results of a logistic regression (reported in Table 5.3) are used to test hypotheses H5.3 to H5.6. None of these hypotheses is rejected. The probability of identifying a relationship between working conditions and absenteeism depends on the employer's assessment of the working conditions, on health complaints, on absence rates and on the number of employees.

Table 5.3 Results of logistic regression on probability that establishment identifies relationship between working conditions and absenteeism

Variable	Model 1 ^c
Size	.43 (.00)
Physically demanding work	.89 (.02)
Mentally demanding work	.98 (.01)
Physical complaints	1.28 (.00)
Stress	.90 (.00)
Working days lost due to absenteeism (ref: 0-1%)	
2-6%	1.04 (.02)
>= 7%	2.16 (.00)
Constant	-5.05 (.00)
<i>Goodness of fit measures:</i>	
% Predicted correctly ^a	79.4
R ² (nagelkerke)	.432
-2 log likelihood	383.3
Chi ² test for model fit ^b	162.6 (.00)
Valid observations	447

a: the reference value is 70%: the (unweighted) share of establishments in the sample for which "recognition" is zero.

b: test for hypothesis that all model parameters (except constant) are equal to zero.

c: reported significance levels (between parentheses) are based on Wald statistics Significance levels according to Likelihood Ratio test statistics are almost identical and lead to the same conclusions.

The estimated equation has been extended with several control variables, none of which have a significant impact⁴³. Amongst others, this implies that the probability of identification does not differ between sectors. Nor is it dependent on the share of elderly employees (aged 45 or higher), on the independency of the establishment, or on whether or not the (obligatory) Risk Inventory and Evaluation (RI&E) has been performed.

Next, we present the estimation results of two models on the probability that establishments actually took precautionary actions during the preceding year (Table 5.4). These models test hypotheses H5.1 and H5.2. Model 2 represents a restricted equation, where the implementation of precautionary measures is explained by establishment size and identification (and control variables - these will be discussed later on in this section). The estimation results are in support of both hypotheses. Larger establishments are more likely to take precautionary actions (*ceteris paribus*) than smaller ones. If a relationship between working conditions and absenteeism is identified, the probability of taking precautionary actions increases. The acceptance of both H5.1 and H5.2 is in accordance with Brouwers et al. (2000).

Table 5.4 Results of logistic regression on probability that establishment has taken measures to reduce physical working conditions and stress in the past year (1994)

Variable	Model 2 ^d	Model 3 ^d
Size	.36 (.00)	.25 (.03)
Identification	.73 (.00)	-.00 (.99)
Physically demanding work		1.00 (.00)
Mentally demanding work		.48 (.16)
Physical complaints		1.07 (.00)
Stress		.44 (.20)
Working days lost due to absenteeism (ref: 0-1%)		
2-6%		.30 (.31)
>= 7%		.54 (.16)
Not independent	.57 (.02)	.63 (.02)
RI&E performed	.87 (.00)	.91 (.00)
Constant	-1.98 (.00)	-2.78 (.00)
<i>Goodness of fit measures:</i>		
% Predicted correctly ^a	70.1	72.8
R ² (nagelkerke)	.228	.324
-2 log likelihood	524.8	484.9
Chi ² test for model improvement ^b		39.9 (.00)
Chi ² test for model fit ^c	82.0 (.00)	121.9 (.00)
Valid observations	438	438

a: the reference value is 51.6%: the (unweighted) share of establishments in the sample that have taken precautionary measures.

b: test for hypothesis that additional parameters (compared to previous model) are equal to zero.

c: test for hypothesis that all model parameters (except constant) are equal to zero.

d: reported significance levels (between parentheses) are based on Wald statistics. Significance levels according to Likelihood Ratio test statistics are almost identical and lead to the same conclusions.

⁴³ Model 1 has been reestimated including the control variables discussed in section 5.5. None of these control variables has a significant impact, which is confirmed by a chi² test for the joint hypothesis that none of these variables has a significant impact.

Further analysis, however, indicates that H5.1 should be rejected. In model 3, the equation on precautionary measures is extended to include the explanatory variables of identification (of a relationship between working conditions and absenteeism). According to the estimation results, identification has no impact anymore on the probability that precautionary measures are taken. Instead, this probability increases with the assumed share of employees for whom the working conditions are physically demanding, and is higher for establishment that have recorded physical complaints. Not all explanatory variables of identification are also determinants of the probability that precautionary actions are taken: mentally demanding working conditions and reported stress have no impact on this probability, and neither does the absence rate.

Two of the control variables have a significant impact on the probability of taking precautionary measures. Establishments that are part of a larger organization are more likely to take precautionary actions, as are establishments that perform an RI&E. These results are not surprising. First of all, according to models 2 and 3, both larger establishments and establishments that are part of a larger organization are more likely to take precautionary actions. This supports the hypothesis that the probability of taking precautionary actions increases with the size of organizations (instead of establishments). Secondly, an RI&E includes that certain precautionary measures should be taken. Our results indicate that this does indeed take place⁴⁴.

Other control variables have no impact. These include the sector of the establishment, whether the establishment falls under a collective labour agreement, and the financial position of the establishment⁴⁵.

5.7 Discussion

The regressions have been performed on establishment level data. The estimation results suggest that we may generalise the results to an organizational level. For model 1, independency of the establishment is found insignificant, implying that the estimated relations are the same for independent organizations and dependent establishments. For models 2 and 3, a significant difference is found between dependent and independent establishments (given the positive effect of establishment size). We interpret this as support for the positive impact of organizational size (instead of just establishment size). In addition, the results do not depend on whether the questionnaire was answered by the employer or not.

Of the six hypotheses, five have not been rejected by our estimations. Hypothesis H5.1, which is at the core of the assumed decision making process, is however rejected by model 3. We will therefore discuss the rejection of this hypothesis, the interpretation of this rejection, and possible explanations in more detail.

⁴⁴ An alternative interpretation is that starting an RI&E is in itself seen as a precautionary measure, irrespective of whether the RI&E resulted in additional precautionary actions.

⁴⁵ Models 2 and 3 have been reestimated including the control variables discussed in paragraph 5.5 (excluding whether the establishment is independent, and whether an RI&E has taken place). For model 2, sectoral differences were found to be significant at a 5% significance level. For both model 2 and 3, a chi² test cannot reject, however, the joint hypotheses that none of these variables has a significant impact.

Support for hypothesis H5.1 is provided by Brouwers et al. (2000). Their result may however be due to a missing variable bias. The missing variables in question are the establishment's judgement of the working conditions and reported health problems. The study by Brouwers et al. (2000) lacks information on these variables. The logistic regression presented in their study is therefore similar to our model 2, which also doesn't reject hypothesis H5.1. The results of model 3 suggest that model 2 suffers from a missing variable bias, and the same bias may apply to the analysis by Brouwers et al. (2000). We therefore conclude that the results by Brouwers et al. (2000) do not conflict with our rejection of hypothesis H5.1⁴⁶.

What are the consequences of the rejection of hypothesis H5.1 for the decision making process? Generally speaking, only half of the establishments that take precautionary actions have identified a relationship between working conditions and absenteeism. For establishments with less than 10 employees, this fraction is even down to one third (Table 5.1). Identification of such a relationship is clearly not necessary for taking precautionary actions. The rejection of hypothesis H5.1 suggests that identification does not even raise the probability of taking precautionary actions. Furthermore, reported health problems (health complaints and absence rate) were hypothesised to have an indirect effect on the probability of taking precautionary measures. Instead, two of the three indicators of health problems have no effect at all. The third indicator, whether employees had made physical complaints, directly increases the probability that precautionary actions are implemented.

How can we explain these findings? First of all, why do firms that assume no relationship between working conditions and absenteeism, take actions to improve those conditions? Several explanations are possible. Certain precautionary measures may be required by law, or expected by external stakeholders. These requirements may differ between firms of different sizes, thus partially explaining the firm size effect. More importantly, our hypotheses are based on the assumption that precautionary actions are taken to improve the ability to attend. Organizations may also use precautionary actions as a means to improve the motivation to attend. This is especially relevant, if employees have ample opportunities to find work elsewhere. This argument is supported by Veerman et al. (2001). They find that recent increases in the efforts of Dutch firms to reduce the inflow into disability are mainly the result of a tightening of the labour market.

Secondly, why are firms that do identify a relationship between working conditions and absenteeism not more likely to take precautionary actions? Especially for smaller establishments, this may be due to a lack of knowledge on where and how to start, or a lack of manpower to take the necessary initiatives. Another argument is the relatively low absence level with smaller establishments. Low absence rates imply that expected benefits of precautionary actions are also limited. Finally, we have not explicitly looked at the costs of implementing precautionary measures. A combination of limited financial resources and implementation costs that are relatively high for small firms may result in

⁴⁶ Bosch and De Kok (1997) also report that identification of a relationship between working conditions and absenteeism has a positive impact on the likeliness that precautionary actions are taken. However, the variable that represents "identification" is defined as a combination of the identification of such a relationship and the variables "physical complaints" and "stress". It is therefore impossible to separate the effects of these variables on the implementation of precautionary actions. In addition, this study also suffers from missing variable bias.

the lack of a relationship between identification and taking actions. The latter two arguments seem however less relevant, given that the financial position of the establishments has no effect on the probability that precautionary actions are taken. This suggests that the costs of precautionary actions do not play a dominant role in the decision making process.

A limitation of the research presented in this chapter is that the question on identification (of a relationship between working conditions and absenteeism) was limited to the actual situation. Respondents were not asked for an assessment of occupational risks, but whether the working conditions partly determined absenteeism. If the actual absence level was very low, respondents could only answer “no” to this question. So, while we were in fact interested in the relationship between working conditions and the perceived probability of employees becoming sick, having an accident, or otherwise becoming absent, we asked for a relationship between working conditions and actual absence levels. Future studies should examine the perceived risk by employers instead of the realization of absence levels.

5.8 Conclusions

Absenteeism results in considerable costs. Absence levels may be reduced by implementing precautionary actions, to improve the working conditions within organizations. In this chapter, we have formulated six hypotheses that describe the decision making process of employers whether or not to take precautionary actions. Five of the six hypotheses are accepted. We find that the probability of taking precautionary actions increases with firm size. The probability of identifying a relationship between working conditions and absenteeism depends on the employer’s assessment of the working conditions, on health complaints, on absence rates and on the number of employees. Identification of such a relationship has however no impact on the probability that precautionary measures are taken. Absence rates and complaints about stress have no effect on this probability; only physical complaints and the assumed proportion of employees whose tasks are physically demanding have a (direct) positive effect on this probability.

The research presented in this chapter suggests that most small firms do not have a deliberate policy of reducing absence rates by improving the working conditions. Given the low absence rates, and the limited time of small-firm employers, this is not a surprising result. The majority of small firms take actions without identifying a relationship between working conditions and absenteeism. Instead, precautionary actions may be taken because of legal requirements, or to improve employee motivation. The financial position of the organization also does not seem to be related to the likelihood of taking precautionary actions. Once it is decided that precautionary actions will be taken, the financial position may well determine the nature of these actions.

Large firms are more likely to take precautionary actions than smaller organizations, irrespective of differences in absence levels and in the probability of identifying a relationship between working conditions and absenteeism. This firm size effect may be due to increased attention from external stakeholders for precautionary actions, differences in legislations, or simply the availability of know-how and manpower to implement certain practices. The reported firm size differences may, however, also reflect differences in respondents’ perception of precautionary measures.

Chapter 6: The impact of firm-provided training on production

6.1 Introduction

According to endogenous growth theories, the accumulation of human capital constitutes the main engine of macro-economic growth (Lucas, 1988, 1993; Romer, 1987, 1996; Mankiw et al., 1992). At a micro level, the resource based theory points to the human capital of employees as a major source for sustained competitive advantage for individual firms (Ferligoj et al., 1997; Koch and McGrath, 1996; Wright et al., 1994). Firms can increase the human capital of their employees by stimulating learning behaviour, such as learning from peers, learning by doing, learning by feedback from customers and suppliers, learning by copying, learning by experiment, learning by problem solving and opportunity taking, and learning from making mistakes (Patton et al., 2000). An important tool for stimulating such learning behaviour is formal, firm-provided training.

It is well known that large firms provide more formal training to their employees than small firms (Black et al., 1999; Barron et al., 1987; Patton et al., 2000). Little is known, however, about the relationship between firm size and the impact of training. Studies in the field of labour economics look into the effects of training on wages and production for large firms. Within the field of entrepreneurship and small business economics, the impact of training on survival, growth and profits of small businesses is examined. Whether the impact of training on production is different for small and large firms, has not received much attention.

This chapter examines the existence of firm-size effects in the impact of firm-provided training. The next section provides background information on training within SMEs, after which we discuss previous research on the returns to training. In section 6.4, we derive hypotheses regarding the impact of firm size on the returns to training. These hypotheses distinguish between direct and indirect firm-size effects. We use a nested production function to estimate the impact of training on production at the level of individual firms. Section 6.5 describes panel data on 173 Dutch firms used to estimate this function. Information on actual time spent in training enables us to separate the benefits of training (due to an increased productivity) from the opportunity costs (training reduced the number of days worked). The production function is derived in section 6.6, and the estimation results are presented in section 6.7 and discussed in section 6.8. The main conclusions are presented in the final section.

6.2 Training within SMEs

Smaller firms provide less formal training to their employees than larger firms do. However, the difference has decreased during the last decennium, at least for the Netherlands (Table 6.1). In 1999, firms with less than 100 employees still spent less than half on training compared to firms with 500 employees or more. In terms of the number of training courses, the difference between these two groups is much smaller.

Table 6.1 Internal and external training courses in the Netherlands, by firm size

Size class (number of employees)	Courses per employee			Training costs (% of labour costs ^a)		
	1990	1993	1999	1990	1993	1999
10 - 99	0.14	0.20	0.69	0.5%	0.8%	1.8%
100 - 499	0.33	0.41	0.85	1.1%	1.3%	2.8%
≥ 500	0.54	0.53	0.81	3.2%	3.1%	3.9%
Total	0.33	0.38	0.77	1.7%	1.8%	2.8%

source: Statline, the on-line database from Statistics Netherlands at www.cbs.nl.

a: training costs include out-of-pocket expenses and lost labour costs.

Employers from both small and large firms generally seem to believe that the initiative for training should preferably be taken by employees. For small firms, this is concluded by Koch and Van Straten (1997), who have interviewed over 20 Dutch employers, mostly from firms with 10-25 employees. Brouwer et al. (2001) have interviewed managers from 10 large Dutch enterprises about their employability policies, and arrive at the same conclusion. However, employees often do not take the initiative. Using a representative sample of employees from firms with 10 or more employees, Brouwer et al. (2001) find that most employees find their educational level and specific knowledge and skills adequate for the required tasks. This might explain their lack of initiative.

Various explanations have been offered to explain why small firms spend less on formal training than large firms. First of all, formal training may be too expensive for small firms (Curran et al., 1997). On the one hand, training costs may be higher for small firms (Westhead and Storey, 1996). Training costs include not only the out-of-pocket expenses of the training course, but also opportunity costs (the costs of lost output). Especially the opportunity costs may be relatively high for small firms: the absence of an individual employee will provide more difficulties, if there are less colleagues to fill in. On the other hand, small firms have less financial resources (Nooteboom, 1993; Westhead and Storey, 1996).

Secondly, the shorter time horizon of smaller firms (Storey, 1994; Westhead and Storey, 1996) makes it less attractive to invest in training. Thirdly, training may increase the outflow of (trained) employees. Due to the relative lack of internal promotion possibilities, the outflow effect may be stronger for smaller firms than for larger ones. In addition, smaller firms have a more limited capacity for the acquisition of information (Nooteboom, 1993). Small firms may be less aware of the available training courses and the associated costs and benefits than large firms. Finally, small firms seem to prefer informal training methods over formal training courses, because it is less costly (Koch and Van Straten, 1997), because it can be more easily integrated into the firm's everyday activities, and because it can be more easily focused on the worker's specific individual and work role needs (Curran et al., 1997).

In this chapter, we focus on firms that have chosen to provide formal training to their employees. Small and large firms differ in the topics on which they provide training (Table 6.2). The majority of training courses taken by Dutch SMEs deals with technical and ICT training and courses on environmental and working conditions. For the UK, similar findings are reported by Curran et al. (1997). Training courses on management and personal skills only account for 17% of all training courses for firms with 10-99

employees. The most notable differences between small and large firms are the provision of technical training and of training on finance and accounting.

Table 6.2 Training course by topic (1999), by firm size

Training course topic	Size class (number of employees)		
	10-99	100-499	≥ 500
Management	5%	5%	8%
Personal skills	12%	16%	17%
Sales and marketing	9%	9%	9%
Finance and accounting	5%	3%	14%
ICT	19%	24%	18%
Technical training	20%	15%	9%
Environmental and working conditions	20%	17%	11%
Other	10%	11%	14%
Total	100%	100%	100%

source: Statline, the on-line database from Statistics Netherlands at www.cbs.nl.

note: both internal and external firm-provided training included.

6.3 Previous research on the returns to training

Studies on training within SMEs are often limited to the impact of management training (which accounts for a minority of all training courses). Despite claims that management training pays off, the relationship between participation in management training and small business performance is not well established (Patton et al., 2000; Westhead and Storey, 1996). The majority of these studies is qualitative, which is in line with results by Heneman et al. (2000).

Within the field of labour economics, most studies on the returns to training are limited to the employee's share of these returns: the impact of training on wages. These studies generally find a positive relationship between training and wages (Groot, 1999b). Employers will only invest in training if they expect to benefit from this investment. This implies that the effect of training on productivity will exceed the effect of training on wages (Dearden et al., 2000). The effects of training on production are, however, less often studied than the wage effects.

At the individual level, the relationship between training and individual performance measures has been examined. These studies generally find a positive effect of training on performance (Groot, 1999a; Gelderblom and De Koning, 1996; Bishop, 1994; Bartel, 1995). They have, however, the disadvantage of using subjective performance measures, either comparing productivity before and after training, or between employees who have and have not followed training courses.

Estimating returns to training using objective performance measures

If the effects of training on firm performance are studied, objective performance measurements can be used. Bartel (1994) employs a panel with observations on US manufacturing firms for 1983 and 1986, to estimate the effect of formal employee training programs on production per employee. Using a fixed-effects estimation procedure to con-

trol for unobserved firm-specific effects, she finds a significant relationship between production per employee and the number of employee groups for which training programs exist.

Black and Lynch (1996) present the estimation results of a production function, based on a cross-section of US firms. They examine whether production depends on the number (or fraction) of workers who received training. No significant relationship between production and this training variable is found. They do, however, find significant effects of specific dimensions of the training programs. In particular, computer training increases production of nonmanufacturing firms, and the proportion of time spent in formal off-the-job training has a significant positive effect on the production of manufacturing firms⁴⁷.

Boon and Van der Eijken (1997, 1998) use panel data for 1990 and 1993. Their dataset contains detailed information on the amount of training provided by individual Dutch firms. Information on training costs is used to construct a measurement for the stock of human capital within a firm. They estimate the impact of the human capital stock on gross production and value added, using two different estimation methods (fixed effects and random effects estimators). Only the random effects estimator results in a significantly positive elasticity of human capital (on value added).

Dearden et al. (2000) examine returns to training at a sectoral level. This makes it possible to account for spillover effects of training. Information on training incidence by individual employees (obtained from a large-scale household survey) is combined with production statistics on capital, labour and output. This results in a panel over a long period (1984-1996) with information on production and training for 94 different industries. They find a significant positive effect of training incidence on production per employee, both for off-the-job and on-the-job training. On average, a 5%-point increase of the fraction of employees who receive training in a certain year would increase labour productivity with 4%⁴⁸.

Endogeneity

Training can influence performance, but firm performance can also influence training. On the one hand, increased organizational performance can stimulate training investments. Treating training as an exogenous variable would then result in an upward bias of the estimated returns to training. Another source for a positive relationship between performance and training is technological change. If changes in production techniques require extra training (Groot, 1999b) and increase productivity levels (Bartel, 1994), then the estimated returns to training suffer from an upward bias. De Grip et al. (1998) test the hypothesis of a positive relationship between technological developments and training incidence, but find no evidence for such a relationship⁴⁹.

⁴⁷ In Lynch and Black (1995) they also present estimations on productivity instead of production. This does not affect the conclusions.

⁴⁸ The mean proportion of workers being trained in an industry is 10%.

⁴⁹ Their indicator of technological change (relative growth of average automation costs per sector of industry) is however not ideal, as they themselves admit.

On the other hand, performance can also have a negative impact on training investments. Bartel (1994) finds that firms with below-average productivity levels are more likely to implement training programs. In addition, firms may decide to introduce training programs when they are faced by negative demand shocks, since this lowers the opportunity costs of training.

One of the few studies in which endogeneity can be controlled for, is Dearden et al. (2000). Because their dataset covers 13 years, they can use lagged variables as instruments in the estimation of their production function. Their estimation results indicate an overall negative effect of performance on training investments. Treating training as an exogenous variable results in an underestimation of the causal effect of training on production.

6.4 Three firm-size effects of the returns to training

A common characteristic of quantitative studies on the production effects of training is that they estimate production functions with a constant production elasticity of training. It can be argued, however, that the production elasticity of training depends on several variables. In this section, we will discuss three different effects, representing three different variables that may influence the elasticity of training. These are the selection effect, HRM effect and scale effect. All of these effects represent direct or indirect firm-size effects.

Returns to training are the combined result of two opposite effects: training increases the production per hour, but decreases the number of productive hours. Since we have information on the number of hours spent in training, we can separate these two effects. The effects discussed in this section are all related to the effects of training on productivity (the benefits of training). The opportunity costs of training will be discussed when the production function is derived.

6.4.1 Selection effect

Organizations that provide training to their employees, must decide which employees take which training courses. Profit-maximizing firms will organize their training program in such a way that the most productive combinations of employees and training courses are selected first (Dearden et al., 2000). The marginal returns to training will then decrease with the amount of training. This is translated in the following hypothesis on the selection effect:

H6.1a: The elasticity of training is negatively related with the number of training days per full-time equivalent.

The selection effect alone does not result in a firm-size effect. This will result only if smaller firms provide on average less training per employee than large firms do. To be more precise, this must hold for the subsample of firms that provide training:

H6.1b: Conditional on training incidence, firm size is positively related with the number of training days per full-time equivalent.

If both hypotheses are true, the elasticity of training is higher for smaller firms than for larger ones.

6.4.2 Human Resource Management effect

The selection effect concerns the relationship between the benefits of training and the amount of training provided. But what determines the benefits of a single training course? The primary outcome of a training course is that something must be learned, for example knowledge, skills and/or attitudes (Holton, 1996). If an employee has learned something, this can result in improved individual production. The transition from learning to improving individual production is however very complicated, and success is not guaranteed (Patton et al., 2000). It not only depends on what has been learned, but also on the motivation to actually apply the learning outcomes at the workplace (Porter and Tansky, 1996). Both the design of the training program and the motivation of employers and employees are important in this respect (Francis, 1995; Rowe and Cooke, 1995). Finally, individual production should increase production and productivity at firm level.

If the effects of training depend on various influences, then a firm must control for these influences if it wants to maximize its returns to training. Setting up a training program with maximal efficiency requires a firm to follow certain steps (Scarpello and Ledvinka, 1988):

1. identify the knowledge gap;
2. formulate the goals of training, and the criteria to evaluate it by. This is beneficial to the transition from learning outcomes to individual productivity, but can also stimulate the motivation to learn and apply;
3. choose the evaluation system;
4. determine the training design (training method, materials used, time and place, etc.);
5. perform the training course;
6. evaluate to which extent the training has reached the formulated goals (not only to learn more about the effects of this specific training course, but also to stimulate the motivation of employees to apply their newly gained knowledge in practice).

Carrying out these steps takes time, and requires specific knowledge on (the effects of) training and available training courses. It is therefore likely that the benefits of firm-provided training depend on the investment of setting up a proper training program: “it is not the presence of (...) training but a distinctive approach to (...) training that matters” (Guest, 1997). A similar argument has been made by Barron et al. (1987) regarding the quality of new applicants. They argue that the quality of new applicants is a function of the investment firms make in their recruitment and selection process. If firms want to increase the average quality of new applicants, this will require screening more applicants and/or screening each applicant more intensively.

We define the time spent on setting up a training program as training support. The Human Resource Management or HRM effect states that investments in training support have a positive effect on the benefits of training. The first step of setting up a training program suggests that the returns to training depend on the training support per employee, whereas the following steps indicate that training support should be related to

the number of training courses. Since we have no information on the number of training courses⁵⁰, we formulate the hypothesis regarding the HRM effect as:

H6.2a: Training support per full-time equivalent and the elasticity of training are positively related.

How does this relate to firm size? On average, small firms have limited resources to gather knowledge on firm training (Nooteboom, 1993; Patton et al., 2000). In addition, small firms are less formalized, which further hampers the development of a formalized training program (see chapters two, three and four). This leads to the following hypothesis:

H6.2b: Larger firms provide more training support (per full-time equivalent) than smaller firms do.

If both H6.2a and H6.2b are accepted, we can conclude that a positive relationship exists between firm size and the elasticity of training.

6.4.3 Scale effect

Both the HRM effect and the selection effect imply indirect effects of firm size. A more direct effect is that larger firms can benefit from economies of scale: if more employees need to take certain courses, courses can be developed that are adjusted to the specific needs of the firm. This includes the topic of the course, but also for example the presentation, the time and the location. Such adjustments can increase the returns to training. The quality of training provided by external parties may even be inappropriate to the needs of smaller firms, because “training is provided by individuals or organizations who may lack an understanding of the particular problems facing small firms” (Storey, 1994, page 292). This leads to the final hypothesis:

H6.3: After correcting for HRM and selection effects, the elasticity of training is positively related with firm size.

Scale effects may also exist regarding the costs of training (both opportunity costs and other costs), but these are excluded from this chapter.

6.5 Research method

6.5.1 Sample and data collection

Detailed information is needed to estimate the returns to firm-provided training at the level of individual firms. For the years 1990 and 1993, such information is available for the Netherlands. For those two years, Statistics Netherlands has created a balanced panel by combining information from the Training Survey, the Wage and Employment Survey and the Production Survey. This dataset has first been discussed and analysed by

⁵⁰ Due to the large variation in training duration (Groot, 1999a), the number of training days is not a suitable indicator for the number of training courses.

Boon and Van der Eijken (1997, 1998). The following description is based on their study.

Training Survey

The Training Survey asks firms in the private sector with five or more employees to provide information on formal training, which is financed completely or partly by firms. The sample used for this study is a sub-sample, originating from firms that were active in training. These firms received a comprehensive questionnaire about training expenditure, training participation, number of days worked by training staff, number of training days followed and the time devoted to the administration and coordination of firm-provided training.

Wage and Employment Survey

From the Wage and Employment Survey information is available on number of days worked and wages for firms which have employees. This survey is based on a two-stage sample design. First, a stratified sample of firms is taken, and then each sampled firm takes a simple random sample of its employees. Sample information on the number of hours worked is then used to estimate the total number of hours worked.

Double counting of training hours is avoided by adjusting the total hours worked for the amounts used in training. This implies that labour input is defined exclusive of the hours worked by (in-firm) trainers and of time spent in training.

Production Survey

In the annual Production Survey, firms in the manufacturing sector are asked for detailed information on inputs and outputs. This information includes sales, gross output, gross value added (at market prices), wage bill, number of employees, costs of materials, electricity consumption and capital consumption allowances (depreciation costs). Since 1987, all firms with 20 or more employees have been surveyed.

The nominal variables in the data set are all deflated to 1990 guilders. Output and materials are deflated by applying 3-digit SIC⁵¹ product and material price index numbers to all firms within the corresponding industry.

Two different methods of measuring capital input are available. First, depreciation costs can be used as a proxy for capital input. Variations in the utilization of the capital stock can result in differences between the depreciation data and the desired measurement of the flow of capital services. A second measurement for capital input is the consumption of electricity. This variable is more likely to reflect fluctuations in the capital usage over time.

Linking the surveys

The cross-sectional data sets for 1990 and 1993 (with 428 and 643 firms resp.) are linked, which results in a balanced panel consisting of 173 firms. The firms belonging to

⁵¹ SIC denotes Standard Industrial Classification of Statistics Netherlands. The 3-digit level allocates industrial firms to 122 groups.

the panel contribute 30% of total training expenditure and cover 17% of total employment in the manufacturing sector in 1993.

The firms in the balanced panel have, on average, a larger workforce than the average Dutch manufacturing firm (see Table 6.3). In 1993, 95% of the firms in the panel has between 75 and 5000 employees, and the average number is about 700. Only 4% of the firms in the panel has on average less than 100 employees, and the smallest firm in our panel still has 40 employees in 1993. In contrast, firms with 20-100 employees account for more than 80% of all Dutch industrial firms with at least 20 employees (ENSR, 1997). The larger average firm size of the panel reflects the fact that larger firms are more likely to provide training. Finally, the chemical industry is over represented in the balanced panel.

Table 6.3 presents summary statistics of the panel and the production survey. The two years under review differ to some extent. Employment, gross output and value added decreased in the period 1990-1993. This is not specific for the balanced panel: the complete production survey shows the same development.

Table 6.3 Summary statistics for the balanced panel of linked data (Panel) and the Production Survey for manufacturing (PS), 1990-1993

	Panel ^d		PS ^d	
	1990	1993	1990	1993
Gross output ^a	298	252	46	41
Value added ^a	96	91	13	11
Number of employees	859	714	127	108
Number of hours worked ^b	1522	1186		
Labour productivity ^c	106	108	101	102
Number of firms	173	173	6154	6681

source: Boon and Van der Eijken (1997).

a: in million 1990 guilders.

b: in thousand working hours.

c: value added per employee in thousand 1990 guilders.

d: averages.

6.5.2 The production function

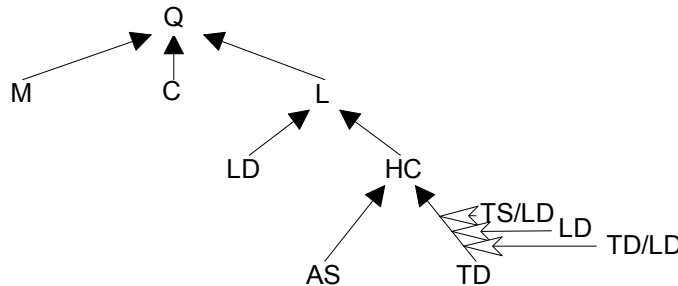
To test the hypotheses, we estimate a nested production function⁵² (Figure 6.1). Gross production Q for firm i at year t is a function of materials M , capital C and efficiency labour L . Efficiency labour L is the outcome of a production process involving the amount of days worked LD and the stock of human capital HC . The human capital stock is determined by the average educational level AS ⁵³ of the work force and firm-provided training. The impact of firm-provided training on human capital is modelled as a func-

⁵² Within an unnested production function, human capital is a production factor of its own, independent of capital and labour. We prefer to treat human capital as a specific component of the production factor "labour". This requires the use of a nested production function (Barret and O'Connell, 2001; Den Butter and Wollmer, 1992).

⁵³ AS represents the Average Schooling level of employees within a firm.

tion of the number of training days (TD), and the human capital elasticity of training days depends on the HRM effect (TS/LD), the scale effect (LD) and the selection effect (TD/LD).

Figure 6.1 A nested production function structure



Using a Cobb-Douglas production function, gross output of individual firms is modelled as:

$$q_{i,t} = \alpha_0 + \alpha_1 \cdot m_{i,t} + \alpha_2 \cdot c_{i,t} + \alpha_3 \cdot l_{i,t} + \alpha_4 \cdot D_t + u_{1i,t} \quad (6.1)$$

where small letters represent the logs of the variables, D_t a year dummy (1993=1) and $u_{1i,t}$ a vector of independent identically distributed (i.i.d.) residuals. The parameters α_1 , α_2 and α_3 denote the output elasticity's of the respective inputs, and α_0 is a constant term.

Labour is modelled as:

$$l_{i,t} = \delta_1 \cdot ld_{i,t} + \delta_2 \cdot hc_{i,t} + u_{2i,t} \quad (6.2)$$

where $LD_{i,t}$ is the total number of days worked, $HC_{i,t}$ the amount of human capital within the firm and $u_{2i,t}$ an i.i.d. disturbance term. The number of days worked is corrected for the time spent in training. Training aims to increase the amount of human capital (HC), but at the same time reduces the available amount of labour days (LD). As a result, equation (6.2) separates the benefits of training from the opportunity costs.

Substituting (6.2) in (6.1) gives the following expression:

$$q_{i,t} = \alpha_0 + \alpha_1 \cdot m_{i,t} + \alpha_2 \cdot c_{i,t} + \alpha_{31} \cdot ld_{i,t} + \alpha_{32} \cdot hc_{i,t} + \alpha_4 \cdot D_t + \varepsilon_{i,t} \quad (6.3)$$

where α_{31} , α_{32} and $\varepsilon_{i,t}$ are defined implicitly. With this specification we assume that increases in the stock of human capital will increase the level of production, not the growth rate⁵⁴. For the empirical investigation, the distinction between level and growth effect is however not relevant: since we only have information on two different points in time, these effects cannot be distinguished from each other.

⁵⁴ See Cörvers (1997) for a discussion of level and growth effects of human capital on productivity.

The human capital stock of a firm depends on the average educational level of the employees. It changes each year, due to changes in the composition of the work force and changes in the human capital of individual employees. We assume that changes in the composition of the work force (and the associated changes in the average educational level of the employees) only play a minor role, given the short time span of the available data⁵⁵. The stock of human capital of firm i in year t can then be defined as follows:

$$HC_{i,t} = (1-\delta) \cdot HC_{i,t-1} + THC_{i,t-1} \quad (6.4)$$

In this equation, δ represents the annual depreciation rate of human capital and THC the increase of human capital due to training of employees.

The human capital increase resulting from firm-provided training depends on the number of training days:

$$thc_{i,t} = \gamma_{i,t} \cdot td_{i,t} + u_{3i,t} \quad (6.5)$$

where TD is the number of firm-provided training days and $u_{3i,t}$ an i.i.d. disturbance term. The human capital elasticity of training $\gamma_{i,t}$ can be modelled as a function of the three firm-size effects.

The Human Resource Management and selection effects

Training support is defined as the number of days a firm spends on administrating and coordinating firm-provided training (carried out by a specific department or employee concerned with training programs). Training support per working day (TS/LD) is used as an indicator for the HRM effect. It represents the average amount of training support per full-time equivalent (fte)⁵⁶. The selection effect can be tested by including the ratio between training days and working days (TD/LD). Some statistics that are related to these indicators are presented in Table 6.4.

The human capital elasticity of training γ can be modelled as a linear function of these indicators:

$$\gamma_{i,t} = \beta_1 + \beta_2 \cdot TS/LD_{i,t} + \beta_3 \cdot TD/LD_{i,t} + u_{4i,t}, \quad (6.6)$$

where $u_{4i,t}$ represents an i.i.d. disturbance term. According to the selection effect (H6.1a) $\beta_3 < 0$ must hold. Hypothesis H6.1b states that $TD/LD_{i,t}$ and the number of employees are positively related. The HRM effect (H6.2a) implies that $\beta_2 > 0$ and hypothesis H6.2b states that $TS/LD_{i,t}$ and the number of employees are positively related.

⁵⁵ Also, effects of learning by doing are not taken into account.

⁵⁶ A full-time equivalent is defined as 220 working days (of 8 hours).

Table 6.4 Panel summary statistics on the HRM and selection effect, 1990-1993, by size class

	1990			1993		
	Number of employees:			Number of employees:		
	40-150	150-500	>500	40-150	150-500	>500
Number of employees ^a	127	283	3095	112	262	2501
Training support / fte ^a	0.16	0.39	1.02	0.17	0.35	0.76
Training days / fte ^a	2.5	2.6	4.2	2.7	3.4	4.1
% of training held during working time ^a	31%	35%	56%	51%	43%	62%
Number of firms	46	89	38	45 ^b	89	38

a: averages.

b: within this size class, one firm reported a fraction of training days per working day of 95% in 1993. This observation has been excluded from this table, and the firm is excluded from further analyses.

The scale effect

The presence of the scale effect can be investigated by introducing a size class dummy in equation (6.6):

$$\gamma_{i,t} = \beta_1(1 + \beta_1' D_{SC\ i,t}) + \beta_2 \cdot TS/LD_{i,t} (1 + \beta_2' D_{SC\ i,t}) + \beta_3 \cdot TD/LD_{i,t} (1 + \beta_3' D_{SC\ i,t}) + u_{4i,t} \quad (6.6')$$

where $D_{SC} = 1$ for large firms and zero otherwise. An F-test on the hypothesis that $\beta_1' = \beta_2' = \beta_3' = 0$ can be used to investigate the scale effect (hypothesis H6.3).

The next step is to substitute (6.6)⁵⁷ in (6.5):

$$thc_{i,t} = \beta_1 \cdot td_{i,t} + \beta_2 \cdot TS/LD_{i,t} \cdot td_{i,t} + \beta_3 \cdot TD/LD_{i,t} \cdot td_{i,t} + u_{3i,t} + u_{4i,t} \cdot td_{i,t} \quad (6.7)$$

In theory, equations (6.4) and (6.7) can be used to construct a time series of the human capital stock $HC_{i,t}$ based on the investment $thc_{i,t}$, for every firm i and year t for which data are available⁵⁸. This would however result in a production function that is non-linear in the parameters to be estimated. To avoid computational complications, this method has not been applied. Alternatively, the human capital increase from training THC can be used as an indicator for the stock of human capital:

$$HC_{i,t} = THC_{i,t} \quad (6.8)$$

for both years, 1990 and 1993. Previous research shows that using (6.4) or (6.8) to represent human capital in a production function yields comparable results (Boon and Van der Eijken, 1997; Dearden et al., 2000).

⁵⁷ For notational convenience, the production function will be derived using (6.6) instead of (6.6').

⁵⁸ Boon and Van der Eijken (1997) use this approach on training expenditures, and Hall and Mairesse (1995) on R&D investments.

Finally, the production function is obtained by substituting (6.7) in (6.3), using (6.8):

$$q_{i,t} = \alpha_0 + \alpha_1 \cdot m_{i,t} + \alpha_2 \cdot c_{i,t} + \alpha_{31} \cdot ld_{i,t} + \alpha_{32} \beta_1 \cdot td_{i,t} + \alpha_{32} \beta_2 \cdot TS/LD_{i,t} \cdot td_{i,t} \\ + \alpha_{32} \beta_3 \cdot TD/LD_{i,t} \cdot td_{i,t} + \alpha_4 \cdot D_t + u_{i,t},$$

with $u_{i,t} = u_{1i,t} + \alpha_{32} \cdot u_{3i,t} + \alpha_{32} \cdot u_{4i,t} \cdot td_{i,t}$ (6.9)

In this specification of the production function, the production elasticity of human capital (α_{32}) is not identified⁵⁹. Consequently, it is not possible to test for constant returns to scale with respect to the firm production function (6.1).

Estimation techniques

The production function (6.9) can be estimated using ordinary least squares, under the assumption that the disturbance term $u_{i,t}$ is i.i.d. with mean zero and a constant variance. However, heterogeneity across firms can occur because of differences in technologies used, the average educational level⁶⁰, the type of output and other HRM measures aimed at improving performance. This heterogeneity between firms can be represented by a firm-specific effect θ_i . In symbols:

$$u_{i,t} = \theta_i + \eta_{i,t} \quad (6.10)$$

where $\eta_{i,t}$ denotes the remaining disturbance, which is assumed to be i.i.d. following a standard normal distribution.

Panel data estimators exploit this specification of the disturbance term. The fixed effects (FE) estimator assumes the firm-specific effects to be fixed parameters, which have to be estimated by including firm-specific dummies in the regression (with $\eta_{i,t}$ replacing $u_{i,t}$ as the disturbance term). Because the sample covers two years, the fixed effects estimator is identical to ordinary least squares (OLS) on the first differences of the production function (6.9). The random effects (RE) estimator assumes θ_i to be a random variable. If the firm-specific effects are uncorrelated with the explanatory variables, then the RE estimator is more efficient than the FE estimator is. It is furthermore preferred over the FE estimator, because the RE estimator delivers unconditional results whereas the results of the FE estimator are conditional on the specific firms in the sample (Hsiao, 1986).

⁵⁹ It is possible, however, to determine the production elasticity of training days $d(q_{i,t})/d(td_{i,t})$. This elasticity is derived in appendix 6.1.

⁶⁰ No information on the educational level is available. Any impact of this variable is therefore included in the disturbance term. We assume that the average educational level within individual firms remains constant during the relatively short period under consideration (1990-1993), which implies that the average educational level is a firm-specific effect.

6.6 Results

The hypotheses regarding the HRM, selection and scale effects are tested by estimating the production function (6.9). First, a correlation analysis is used to investigate hypotheses H6.1b and H6.2b, which state that the number of employees is positively related with both training support per working day and training days per working day.

The correlations given in Table 6.5 indicate that positive relations indeed exist, but in a non-linear way: both training support (per working day) and training days (per working day) are stronger correlated with the log of the number of employees than with the number of employees. Apparently, the correlations with firm size are stronger for smaller and medium-sized enterprises than for large enterprises. Furthermore, the correlation is stronger for training support than for training days.

Table 6.5 Correlations between number of employees and training support / training days

	Number of employees	Log(number of employees)
Training support / working day	0.14 (0.009)	0.32 (0.000)
Training days / working day	0.07 (0.19)	0.17 (0.001)

note: standard errors given between brackets.

Next, we investigate the possibility of multicollinearity. This can be done by inspection of the correlations between the regressors. Because our dataset only covers two years, the fixed effect estimation is identical to OLS on first differences. So, rather than checking the correlations between the levels of the regressors, the correlations between the first differences of these variables should be looked at. It turns out that the largest correlation (between changes in td and changes in $TD/LD \cdot td$) is only 0.55. We take this as a sign that there is no danger of multicollinearity.

The production function (6.9) is estimated using both the fixed effects and the random effects estimator. The results are reported in Table 6.6 (explaining gross production) and Table 6.7 (explaining value added). Capital is measured by electricity usage; using depreciation costs invariably results in an insignificant elasticity of capital. The use of panel data estimation techniques is justified by the F-test for firm-specific effects: the hypothesis that no effects are present is rejected for the FE estimations.

Hausman's test statistic is used to test for a dependency between regressors and firm-specific effects. According to this statistic, the RE estimator is to be preferred: the hypothesis that the firm-specific effects are uncorrelated with the regressors cannot be rejected. There are however reasons to doubt this conclusion. First, if depreciation costs are used to measure capital, Hausman's test statistic does reject the no-correlation hypothesis⁶¹. Secondly, this test statistic is based on the assumption that the disturbance is homoscedastic. Goldfeld-Quandt test statistics, however, indicate that the disturbances are heteroscedastic. Finally, the error component $\alpha_{32} \cdot u_{4i,t} \cdot td_{i,t}$ in the production function (6.9) suggests that the firm-specific effects are correlated with the regressors. We therefore prefer the FE specification. For this specification, a heteroscedastic-robust estimation has been performed. Both the standard and the robust estimates of the standard er-

⁶¹ For gross production, the value of the test statistic is 20.09, with a probability-value of 0.00. For value added, the test statistic equals 28.71 with a probability value of 0.00.

errors of the parameters are given in Table 6.6 and Table 6.7. Especially the standard errors of the training-related variables benefit from this correction.

Table 6.6 Estimation results of a Cobb-Douglas production function explaining log(gross production)

	Fixed effects estimation			Random effects estimation	
	Par.	St. error	Robust st. error ^e	Par.	St. error
Materials	0.76	0.030***	0.032***	0.78	0.012***
Capital ^a	0.047	0.022**	0.020**	0.021	0.008***
Labour	0.20	0.036***	0.035***	0.21	0.016***
Training days	-0.0042	0.01	0.008	0.0037	0.0083
Training support per working day ^b	0.23	0.12*	0.083***	0.22	0.11**
Training days per working day ^b	0.013	0.063	0.056	0.013	0.057
Time-dummy	-0.017	0.0077**	-	-0.015	0.0073**
Hausman ^c				6.70	(0.35)
F-test for firm-specific effects ^c	5.15	(0.000)***			
F-test for scale effect ^c	1.10		(0.35)	0.47	(0.70)
F-test for returns to training ^c	1.60		(0.19)	0.92	(0.43)
Goldfeld-Quandt ^{c,d}	1.48	(0.01)*		1.50	(0.009)***
Jarque-Bera ^c	36.7		(0.00)***		
Adjusted R ²	0.9969		0.8788	0.9936	
N	344		172	344	

*: significant at 10%.

**: significant at 5%.

***: significant at 1%.

a: capital measured by electricity consumption.

b: multiplied with log (training days).

c: p-value between brackets. If given in column "robust st. error", the test statistic is calculated from the robust estimation results.

d: observations ordered by training days; 75 firms with smallest and largest values are compared; similar conclusions are obtained if observations are ordered by gross production and labour.

e: heteroscedastic-consistent estimates, obtained by estimating the FE model as OLS on first differences. This causes the time-dummy to disappear from the regression equation, the number of observations is halved and the adjusted R² is computed differently.

note: constant and parameters for three sector dummies are not reported.

Table 6.7 Estimation results of a Cobb-Douglas production function explaining log(value added)

	Fixed effects estimation			Random effects estimation	
	Par.	St. error	Robust st. error ^e	Par.	St. error
Capital ^a	0.23	0.086***	0.092**	0.11	0.026***
Labour	0.80	0.13***	0.13***	0.87	0.052***
Training days	0.014	0.038	0.033	0.055	0.031*
Training support per working day ^b	0.73	0.47	0.31**	1.00	0.42**
Training days per working day ^b	0.024	0.25	0.16	-0.059	0.21
Time-dummy	-0.072	0.030**	-	-0.064	0.028**
Hausman ^c				7.10	(0.21)
F-test for firm-specific effects ^c	4.08	(0.000)***			
F-test for scale effect ^c	0.73		(0.53)	0.18	(0.91)
F-test for returns to training ^c	1.37		(0.25)	0.70	(0.55)
Goldfeld-Quandt ^{c,d}	2.19	(0.000)***		2.25	(0.000)***
Jarque-Bera ^c	363.7		(0.00)***		
Adjusted R ²	0.9505		0.3094	0.8982	
N	344		172	344	

*: significant at 10%.

**: significant at 5%.

***: significant at 1%.

a: capital measured by electricity consumption.

b: multiplied with log (training days).

c: p-value between brackets. If given in column "robust st. error", the test statistic is calculated from the robust estimation results.

d: observations ordered by training days; 75 firms with smallest and largest values are compared; similar conclusions are obtained if observations are ordered by gross production and labour.

e: heteroscedastic-consistent estimates, obtained by estimating the FE model as OLS on first differences. This causes the time-dummy to disappear from the regression equation, the number of observations is halved and the adjusted R² is computed differently.

note: constant and parameters for three sector dummies are not reported.

Only support for HRM effect

The estimation results indicate that a human resource management effect indeed exists. Both FE (robust) and RE report a significant impact of training support per working day on gross production and value added. What does this mean? Given training support, increasing the number of training days will increase gross production and value added. But also, given the number of training days, an increase in training support will increase

performance. The more support employees receive, the more effective training is. The results even suggest that training has no effect at all, if it is not accompanied by training support: the parameter for training days does not significantly differ from zero. Because smaller firms provide on average less training support per working day than larger firms, smaller firms benefit less (cet. par.) from additional training.

Contrary to the expectations of Dearden et al. (2000), we find no support for a selection effect: the benefits of training do not depend on the number of training days per employee. There is also no indication of a scale effect within our sample. To test for this effect, we have estimated an alternative specification of the production function, with the human capital elasticity defined by equation (6.6') instead of (6.6). This enables the use of an F- test to test for the presence of a scale effect (H6.3), comparing 45 firms with less than 150 employees (1990) with 127 larger firms. We cannot reject the hypothesis of no scale effect, for none of the four specifications.

The benefits of training

Without training support, training has no effect at all: the parameters of both training days and training days per working day are not significantly different from zero. With only an HRM effect present, the human capital elasticity of training equals $\beta_2 \cdot TS/LD$, and the production elasticity of training⁶² becomes $\alpha_{32} \beta_2 \cdot TS/LD$. This elasticity can be used to estimate the impact of an increase of the number of training days with five days per employee. Using average numbers for TS/LD for different size classes, the estimated effects are given in Table 6.8. The reported effects are very small. This is not surprising, once we realise that we estimate the effect of additional training days on total production and value added, and that full-time employees follow on average less than 5 training days per year (Table 6.4).

Table 6.8 Estimated impact of an increase of 5 training days for different size classes

Size class (number of employees)	Gross production	Value added
40-150	+ 0.033%	+ 0.11%
150-500	+ 0.055%	+ 0.17%
>500	+ 0.10%	+ 0.32%

According to these calculations, the benefits of an increase of the number of training days are 3 times as large for the average large firm than for the average small firm in our sample.

Additional tests

Some additional calculations have been made to establish how robust these conclusions are. First, the conclusions regarding the benefits of training do not depend on the choice of available capital measurements. Using a robust fixed effects estimator, the HRM effect is significant (at a 1% level) for both gross production and value added if capital is measured by depreciation costs.

⁶² The opportunity costs of training, which are part of the production elasticity of training, are excluded here. The opportunity costs will be discussed in the next section.

Next, we have included the share of training days held externally and the fraction of training days held during working hours in the production function. Contrary to Lynch and Black (1995), we do not find an indication of any relevance of these variables for production levels.

If training expenditures instead of training days are used, the parameter estimates are comparable. The significance of the training-related variables drops however; only the RE specification finds a significant effect of training on valued added (this result is comparable with Boon and Van der Eijken (1997), who use the same dataset).

In addition to testing for the significance of the separate firm-size effects, we investigate the joint significance of all effects. To this end, an F- test is performed: the production function is estimated with and without the training-related variables, and the F-test statistic for returns to training is calculated using the residual sum of squares of these alternative specifications. Despite the fact that the HRM effect significantly differs from zero, the F-test for returns to training cannot reject the hypothesis of no returns to training. A final test statistic suggests that the above results must be interpreted with some caution: the test statistics assume that the disturbances are normally distributed, but according to the Jarque-Bera test this is not the case.

6.7 Discussion

Selection effect

In the absence of a selection effect, the benefits of training do not decrease with the amount of training. Various explanations are possible for the lack of evidence for a selection effect. First of all, there may indeed be no such relationship. For example, firms may select employees and training programs according to their expected effect on profitability instead of productivity. This can result in a different ranking: training courses can have different costs per training day, and employees differ in their expected remaining tenure.

Another explanation is that firms have no adequate information on the qualities of their employees, of the available training courses, and of every match between employee and training course. This makes a correct ranking impossible. This problem is especially relevant considering the different types of training. It may be very difficult for an employer to compare the expected benefits of a welding course and a management training.

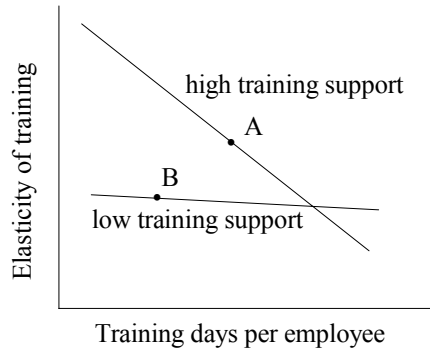
According to Hocquet (1999), British and French firms use different criteria to select employees for training. In France, less efficient workers are more likely to be selected for training, while in the UK selection is independent of efficiency⁶³. This indicates that the importance, or even presence, of a selection effect can differ between countries.

Finally, we have treated the HRM effect and selection effect independent from each other. The selection effect, however, requires firms to have certain information on employees and training courses. According to the HRM effect, gathering this information

⁶³ Relative efficiency is indicated by relative wage differences between employees who are identical in all other observable characteristics, such as school qualifications, seniority and experience.

is an important part of training support. This suggests a combination of the selection effect and HRM effect. The elasticity of training, $\gamma_{i,t}$, may decline with the number of training days per employee (the selection effect), where the rate of decline increases with training support (HRM effect). This is illustrated in Figure 6.2. Following this argument, firm A will have a higher elasticity of training than firm B, despite the fact that firm A provides more training days, and the elasticity of training decreases with the amount of training days per employee. We have not corrected for this combined effect, which can explain the lack of empirical support for the selection effect.

Figure 6.2 The selection and HRM effects combined



Scale effect

The estimation results provide no evidence of a direct firm-size effect. However, the available dataset only includes 11 firms with less than 100 employees, and none with less than 40. The rejection of the scale effect is therefore not valid for firms with less than 100 employees. It remains an open question whether the scale effect exists between firms with more and less than 100 employees, and within the (large) group of smaller firms.

The opportunity costs of training: comparing costs and benefits

Table 6.8 presents the estimated benefits of training: the increase in annual production and value added that results from an increase in labour productivity. These calculations do not take account of the reduction in days worked, which occurs if employees are off to follow a training during working hours. The associated loss of production constitutes the opportunity costs of training. If we assume that 50% of all training days is held during working time (Table 6.4), then an increase of the number of training days with five days per employee results in a decrease of 2.5 working days per employee. This results in a 0.23% decrease of gross production and a 0.92% decrease of value added.

How much time does it take to recover these opportunity costs? If we are willing to make some crude assumptions, we can calculate the break-even point where the opportunity costs are offset by the benefits. Assuming an annual human capital depreciation rate of 10% and a discount rate of 4%, small firms have a break-even point of 20 years for gross production, and the opportunity costs will never be fully compensated by an increased productivity. For firms with 150-500 employees, the break-even points are 6

and 9 years for production and value added, and for the large firms the break-even points are 3 and 4 years.

We must be careful with any conclusions regarding the profitability of training investments. First, different assumptions regarding depreciation and discount rates lead to different outcomes. Next, we assume that a reduction of 2.5 working days per employee has equal (relative) effects for small and large firms. It is, however, likely that small firms suffer from diseconomies of scale. “If a firm has 4 employees and one attends a training course away from the firm, a quarter of the firm’s labour force is lost for that period. (...) No cash can create substitutes for a key employee who is part of an integrated, experienced work team” (Curran et al., 1997). Thirdly, not all training costs are included.

In addition, the research presented in this chapter does not include all determinants of the benefits of firm-provided training. The expected remaining tenure of trained employees is not taken into account, nor the time horizon of the employer. A relatively short time horizon reduces the total expected benefits. Finally, benefits of individual training courses show a large variation (Groot, 1994). Therefore, firms that provide less training to their employees are confronted with a higher uncertainty regarding the average returns to training. Given the limited financial resources of smaller firms, firms may choose not to take this risk.

Some limitations of the dataset

The panel used in this chapter only covers two years. This makes it impossible to control for the endogenous nature of training. This problem is common to most studies on the returns to training, with the exception of Dearden et al (2000). According to their results, treating training as an exogenous variable results in a downward bias. This would imply that our results are a lower boundary for the true impact of training on production.

Another characteristic of our dataset is that it includes only firms who provide training on a regular basis. This introduces the risk of a sample selection bias. If the likelihood of providing training is positively correlated with the elasticity of training, we would overestimate the elasticity for the population of all firms; our results would then “only” hold for those firms that already provide training.

The sample selection effect closely resembles the within-sample selection effect that is examined in this chapter. Where the sample selection effect assumes that the elasticity of training differs between firms that provide training and those that don’t, the within-sample selection effect implies that the elasticity of training differs between firms that provide relatively much training with those that provide relatively less. As we have seen, we have found no support for the within-sample selection effect, despite the fact that the annual amount of training varies from nearly zero (0.05) to 28.5 training days per fte in our sample. We therefore argue that selection effects are less important than the HRM effect. Further research is of course needed to substantiate this suggestion, but for now, we assume that a sample selection bias is not likely to be very important.

6.8 Conclusions

According to Storey (1994, page 293), “considerable doubts over the effectiveness of small business training have to be registered”. This chapter confirms Storey’s doubts. We have identified three different firm-size effects on the returns to firm-provided training: the HRM effect, the selection effect and the scale effect. Empirical support is found for the HRM effect. According to this effect, a positive relationship exists between the amount of training support and the impact of firm-provided training on labour productivity. Firms that invest more time in setting up and managing their training activities enjoy higher benefits of training. On average, large firms provide relatively more training support to their employees than smaller firms. This results in an indirect firm-size effect. The importance of training support confirms the results of Gelderblom and De Koning (1996) and Lynch and Black (1995). These studies illustrate the need to take account of the complexity of the training process in order to measure the returns to training.

The results presented in this chapter are obtained using data on Dutch manufacturing firms with 100-5000 employees providing training to their employees. Generalisation to smaller firms, other countries and to firms who do not provide training is not without difficulties.

An important question is whether the HRM effect represents a causal relationship. The results by Dearden et al. (2000) suggest that treating training as an exogenous variable (as is the case in this chapter) results in an underestimation of the impact of training on production and value added. However, since their study uses information from a different country at a different level of aggregation, it is not clear whether their result also applies to this chapter.

Previous studies that estimate the elasticity of training (Bartel, 1994; Dearden et al., 2000) indicate a positive effect of training on production. They are, however, not able to distinguish between the benefits and opportunity costs of training. Our estimations allow to separate these two effects. Tentative calculations suggest that the balance between benefits and opportunity costs is more favourable for large firms than for small firms. We must however be careful with any conclusions regarding the profitability and desirability of training investments for small firms.

Appendix 6.1: The production elasticity of training days

In this appendix, we derive the production elasticity of training days, $d(q_{i,t})/d(td_{i,t})$, for production function (6.9). In doing so, we take account of the fact that changes in the number of training days result in changes in the number of days worked: we assume that

$$TLD_{i,t} = LD_{i,t} + \varphi \cdot TD_{i,t} + TS_{i,t} \quad (6.1')$$

with TLD the total number of (labour) days available for a firm, and φ the fraction of firm-provided training that is followed during working hours. We assume that TLD is fixed. Given the importance of the HRM effect, which is measured by the amount of training support per working day TS/LD, we write $TS_{i,t}/LD_{i,t} = RTS_{i,t}$ and rewrite equation (6.1') as

$$\begin{aligned} TLD_{i,t} &= (1 + RTS_{i,t}) \cdot LD_{i,t} + \varphi \cdot TD_{i,t} \\ \Leftrightarrow \\ LD_{i,t} &= \frac{TLD_{i,t} - \varphi \cdot TD_{i,t}}{1 + RTS_{i,t}} \end{aligned} \quad (6.2')$$

The production elasticity of training days is then given by the following equation:

$$\frac{d(q_{i,t})}{d(td_{i,t})} = \alpha_{31} \cdot \frac{d(ld_{i,t})}{d(td_{i,t})} + \alpha_{32} \cdot \beta_1 + \alpha_{32} \cdot \beta_2 \cdot RTS_{i,t} + \alpha_{32} \cdot \beta_3 \cdot \frac{d(\frac{TD_{i,t}}{LD_{i,t}} \cdot td_{i,t})}{d(td_{i,t})} \quad (6.3')$$

Since

$$\frac{d(ld_{i,t})}{d(td_{i,t})} = \frac{d(LD_{i,t})}{d(TD_{i,t})} \cdot \frac{TD_{i,t}}{LD_{i,t}} = -\frac{\varphi}{1 + RST_{i,t}} \cdot \frac{TD_{i,t}}{LD_{i,t}} \quad (6.4')$$

and

$$\frac{d(\frac{TD_{i,t}}{LD_{i,t}} \cdot td_{i,t})}{d(td_{i,t})} = \frac{d(\frac{TD_{i,t}}{LD_{i,t}})}{d(td_{i,t})} \cdot td_{i,t} + \frac{TD_{i,t}}{LD_{i,t}}, \quad (6.5')$$

where

$$\frac{d(\frac{TD_{i,t}}{LD_{i,t}})}{d(td_{i,t})} = \frac{d(TD_{i,t})/d(td_{i,t})}{LD_{i,t}} - \frac{TD_{i,t}}{LD_{i,t}^2} \cdot \frac{d(LD_{i,t})}{d(td_{i,t})}, \quad (6.6')$$

with

$$\frac{d(LD_{i,t})}{d(td_{i,t})} = \frac{d(LD_{i,t})}{d(ld_{i,t})} \cdot \frac{d(ld_{i,t})}{d(td_{i,t})} = LD_{i,t} \cdot \frac{d(ld_{i,t})}{d(td_{i,t})}, \quad (6.7')$$

equation (6.3') can be rewritten as

$$\begin{aligned} \frac{d(q_{i,t})}{d(td_{i,t})} = & -\frac{\varphi \cdot \alpha_{31}}{1 + RTS_{i,t}} \cdot \frac{TD_{i,t}}{LD_{i,t}} + \alpha_{32} \cdot \beta_1 + \alpha_{32} \cdot \beta_2 \cdot RTS_{i,t} + \\ & + \alpha_{32} \cdot \beta_3 \cdot \frac{TD_{i,t}}{LD_{i,t}} \cdot [1 + td_{i,t} \cdot (1 + \frac{\varphi}{1 + RTS_{i,t}} \cdot \frac{TD_{i,t}}{LD_{i,t}})] \end{aligned} \quad (6.8')$$

The first element of the right-hand side of equation (6.8') defines the opportunity costs of training. The benefits of training, which are defined by the remaining terms of the right-hand side of equation (6.8'), represent the increase in total production and value added due to an increased productivity. Notice that an increase in the amount of training days per working day (TD/LD) not only decreases the benefits of training (in the presence of a selection effect, i.e. $\beta_3 < 0$), but also increases the opportunity costs of training. Training support per employee (RTS) has opposite effects, both on the benefits of training and on the opportunity costs.

Chapter 7: The effects of transaction costs and human capital on firm size

7.1 Introduction

Why do firms differ in size? From microeconomic theory, we know that economies of scale, resulting from technical and allocational efficiency, can explain cross-industry differences in average firm size. It does not, however, explain differences in firm size of firms that are operating in similar environments. Other theories have been developed to explain the vast heterogeneity in firm size. Three alternative approaches to explain firm size may be distinguished (You, 1995). According to the transaction cost approach (or institutional approach⁶⁴), firm size is determined by transaction cost efficiency (Becker and Murphy, 1992; Davis and Henrekson, 1999; Williamson, 1967). Within the industrial organization approach, size distribution is explained by market power. Thirdly, the growth approach focuses on the dynamics of the size distribution of firms. This approach includes life-cycle models, evolutionary models on firm growth and studies on Gibrat's law (Almus and Nerlinger 1999; Dutta and Prasad, 1996; Erikson and Pakes, 1995; Sutton, 1997).

Firm size is often measured by the size of the labour stock. Recently, the attention of economic research has focused on labour flows⁶⁵. Analysis of large longitudinal datasets at enterprise level provides insight into the specific characteristics of labour flows between enterprises and establishments, and their connection with labour market dynamics (Davis and Haltiwanger, 1990,1992; Davis et al., 1996). An important finding is that worker flows exceed job flows. For the Netherlands, Hamermesh et al. (1996) find that worker turnover is roughly three times as large as job turnover. The largest part of job turnover (job creation + job destruction) takes place within the same regions and branches of industry. This implies that job creation and job destruction are much more driven by idiosyncratic, firm-specific shocks than by demand and supply shocks at macro level.

Differences in firm size are likely to affect worker turnover and internal labour flows. From that perspective, we examine the relationship between firm size and internal labour flows. In doing so, we combine literature on labour flows with the standard neo-classical and transaction cost approaches to explain firm size. For this purpose, we construct an empirical simulation model that incorporates various mechanisms that may be regarded as underlying sources of firm heterogeneity. We investigate how this combination of theories can explain firm size differences.

⁶⁴ From a macroeconomic point of view, transaction costs include costs associated with existing institutions. Transaction cost theory then effectively becomes an institutional theory of the firm (You, 1995, page 448).

⁶⁵ Labour flows and migration patterns have been studied extensively at a macro level (Borjas, 1994; Reichlin and Rustichini, 1998), but at a micro level, labour flows have only recently gained attention.

Although firm behaviour is described by profit maximization, building and solving an analytical model that incorporates all required sources of heterogeneity appears impossible. Therefore, we use a simulation model that is calibrated using the scarce empirical evidence on internal labour flows (Van Gameren, 2000). Simulation models have been used previously, mostly involving Gibrat's law. These simulation models are, however, of a different nature than the simulation model used in this chapter. Simulation models on Gibrat's law examine firm size distribution. These models focus on the growth processes of interacting firms, taking account of entry and exit and a dynamic market (Ericson and Pakes, 1995; McCloughan, 1995). Instead, this chapter looks into the internal labour flows within individual firms, to examine the equilibrium level of the size of individual firms in a static environment.

The main theoretical perspective that is applied in this chapter is the transaction cost approach. The optimal size of individual firms in our model is determined by an equilibrium, where marginal internal costs are equal to marginal external costs. Following the Coase criterion, the internal costs are not only determined by production costs (wages), but also by internal transaction costs associated with coordination of labour in the hierarchy of the firm. Our simulation exercises focus on changes in the internal transaction costs, which are implemented by parameter changes in the model. We leave the external (market) costs unaltered by assuming a completely elastic demand for the firm's product and a fixed price. However, these transaction costs could, in principle, also be subject of a sensitivity analysis (see Den Butter and Van Gameren, 2000).

The structure of this chapter is as follows. The next section reviews what the literature on transaction costs, hierarchical models of the firm, equilibrium search theory and internal labour markets can teach us about the underlying sources of heterogeneity amongst enterprises. This gives us a hint on how to make this heterogeneity operational in the model. Section 7.3 discusses how these features are implemented in the simulation model, and the calibration of the model. The following two sections discuss simulation outcomes. Section 7.6 concludes.

7.2 Theoretical background

Transaction costs

Adam Smith stated that firm size is determined by benefits and costs of specialization of labour, resulting in economies of scale. The degree of specialization would be limited mainly by the extent of the market⁶⁶. Coase (1937) examined whether this specialization should take place within one single firm, or between several enterprises. He introduced the idea of transaction costs, to explain which transactions should take place in the market, and which transactions are more efficient within the framework of an enterprise. Transaction cost theory assumes that all transactions are costly due to bounded rationality and opportunism. We adopt the concept of transaction costs to incorporate the cost of an enterprise's internal organization in our simulation model. As mentioned in the introduction this is the main mechanism that determines optimal firm size in our model.

⁶⁶ Assuming that employers want to maximize their profits.

Transaction cost theory generally discusses inter-firm relations, and in particular the make-or-buy decision (Klos and Nooteboom, 2001). However, our focus is on internal transactions, and, therefore, on internal transaction costs. All transactions require coordination and cooperation from the individuals involved; hence, transaction costs can be classified into coordination and motivation costs (Milgrom and Roberts, 1992). Internal coordination consists of several steps (each resulting in internal coordination costs): obtaining information needed to determine an efficient plan for a transaction; using the knowledge available to determine the plan to be implemented; communicating the plan to those responsible for implementing it; and monitoring the plan. Motivation costs may arise due to information incompleteness, information asymmetries and imperfect commitment (resulting in hold-up problems). Nooteboom (1993) and Garnsey (1998) argue that small businesses have a behavioural advantage over large enterprises, in that employees in smaller businesses are more motivated. This results in higher motivation costs (per employee) for larger enterprises.

These transaction costs refer to costs of vertical transactions: transactions that involve different hierarchical levels within an enterprise. However, transactions may also take place within a certain level. Becker and Murphy (1992) argue that both horizontal coordination and motivation costs per employee increase with the number of employees.

Hierarchical models of the firm

Williamson (1967) used a hierarchical model of an individual enterprise to examine determinants of optimal firm size⁶⁷. This model delineates a price-taking enterprise with m administrative levels. Each employee may supervise s subordinates, i.e. the span of control equals s . Williamson also introduced a “compliance” or “loss of control” parameter that indicates the effective contribution of an employee to the objectives of his supervisor. The compliance parameter is less than 1, reflecting that “only a fraction of the intentions of the superior is effectively satisfied by a subordinate” (Williamson, 1967). Without loss of control, the enterprise would have an infinite number of levels; in effect, its size would be limited by the size of the market only.

The loss-of-control parameter in this model may be interpreted as a measurement for vertical internal transaction costs. This interpretation becomes clear when we explore Williamson’s argument to introduce the loss of control. The intentions of the supervisor will never be fully satisfied because either the communication between supervisor and subordinate is imperfect, or because subordinates do not follow up on agreements made. The first explanation reflects (vertical) coordination costs, the second motivation costs. Williamson’s (1967) conclusion that the compliance parameter must be less than 1 for enterprises to become finite is, therefore, similar to the conclusion by Coase (1937) that firm size is finite due to positive (internal) transaction costs.

Becker and Murphy (1992) argue that optimal firm size is related to the degree of specialization and coordination costs *within* hierarchical levels. In their model, individual production increases with team size. This is because larger teams allow for more specialization. The benefits of specialization are balanced with the increasing costs of co-

⁶⁷ This model has later been augmented by Calvo and Wellisz (1978) and Keren and Levhari (1979).

ordination between a larger number of more specialized workers. They find that under general conditions, team size is limited by coordination costs instead of market size.

Equilibrium search and internal labour markets

An objective for our simulation model is that it should outline the dynamic time path of the enterprise in response to various types of external shocks. Therefore, the actual firm size should continuously be adapted to its optimal size, taking account of adaptation costs (e.g. costs of hiring, firing and training). So as to outline this dynamic adjustment process, the model combines insights of modern equilibrium search models and the flow approach of the labour market (Mortensen and Pissarides, 1998) with insights from internal labour market models (Doeringer and Piore, 1971). These theories also explicitly take worker heterogeneity into account. Our model also incorporates this feature, in order to examine how and when differences in human capital may result in differences in firm size.

7.3 Internal labour flows in a hierarchical model of the firm

Our simulation model focuses on formalizing decisions of personnel managers on the allocation of employees over the jobs available. The model specifies hierarchical levels in line with Williamson (1967), and applies the theory developed by Becker and Murphy (1992) to model benefits and costs of cooperation within teams/levels. This allows us to endogenize the span of control, which is exogenous in Williamson (1967). In this section, we outline the specification and calibration of the model⁶⁸.

Independent decisions

The key assumption in our hierarchical model is that each employee decides whether he or she spends time on the production of output or on supervising subordinates (or on a combination of both) independently from others in the enterprise. Under specific conditions, this yields identical results as when all decisions are centralized. We consider this decision for each individual to be taken by the management of the business rather than by employees themselves.

Profit maximization

Optimisation starts with the highest-ranked person in the enterprise. He determines the optimal number of subordinates for his circumstances by maximization of his contribution to the business's profits. The profit function in period t of each supervisor (occupied at hierarchical level i) is specified as:

$$prf_{it}(n_t) = \sum_{j=0}^{n_t} \{p_t \cdot a(n_t) \cdot q_{j,i+1,t} - w_{j,i+1,t} - fp_{j,i+1,t}\} - AC(n_t, n_{t-1}^*), \quad (7.1)$$

⁶⁸ This model is a variant of the model developed by Van Gameren (2000). We refer to his study for further details.

and is maximized with respect to the number of subordinates n_t , given the currently available number of subordinates n_{t-1}^* . Profit depends upon benefits and costs of employing subordinates. Benefits result from the production $q_{j,i,t}$ of individual employees, and costs are determined by wage costs ($w_{j,i,t}$), supervision costs ($\bar{p}_{j,i,t}$) and adjustment costs (AC). The function $a(n)$ refers to the benefits and costs of cooperation. The final element of this production function is the output price level (p_t), which is normalized to 1.

Benefits of specialization

The benefits of specialization (i.e. hiring one or more subordinates) consist of the production generated by the subordinates. We specify individual production functions, based on the quality of the employee:

$$q_{j,i,t} = \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot c_{j,i,t}, \quad (7.2)$$

where the relative quality measure $c_{j,i,t}$ is defined in such a way as to represent the quality of the individual employee relative to the expected quality of external applicants at hierarchical level i :

$$c_{j,i,t} = qual_{j,i} / E(qA_{it}) \quad (7.3)$$

where $qual_{j,i}$ is the actual quality of subordinate j , and $E(qA_{it})$ the expected quality of an external applicant.

If more subordinates are recruited, the tasks that must be performed and coordinated by the supervisor may be divided over a larger group of subordinates. This results in specialization of the subordinates, which yields an increased individual productivity. A subordinate's contribution to firm production is, therefore, modelled as a function of individual productivity $q_{j,i,t}$ and the number of subordinates within his team. This is included as part of the cooperation function:

$$a(n) = -\alpha n^2 + \beta n + 1, \quad (7.4)$$

where β refers to the benefits of cooperation.

Horizontal and vertical transaction costs

Increasing the number of subordinates not only increases the benefits of specialization, but also increases horizontal transaction costs (both coordination and motivation). We assume that the horizontal transaction costs per subordinate rise with the number of subordinates (Becker and Murphy, 1992), which is represented by the parameter α in the cooperation function $a(n)$. The parabolic nature of this function implies that individual productivity may benefit from cooperation with other subordinates (of the same supervisor) at the same hierarchical level, as long as the number of subordinates does not become too large; hiring too many subordinates turns the cooperation into a negative factor when specialization is extended too far.

The model also incorporates vertical transaction costs. These are the sum of foregone production and loss of control. Foregone production measures the time a supervisor has to spend on supervising and coordinating the subordinate; while coordinating, he cannot

contribute to production. The amount of coordination required by a subordinate depends negatively on his qualities:

$$fp_{j,i,t} = \gamma_{fp,1} \cdot (\gamma_{fp,2})^i \cdot (1/c_{j,i,t}) \quad (7.5)$$

Loss of control measures the extent as to which, even after coordination, subordinates still will not be able/willing to produce the output required by their supervisor. The loss of control is represented by the parameter $\gamma_{q,2}$ in the production function.

Wage costs

Besides horizontal and vertical transaction costs, the costs of subordinates depend on their wages:

$$w_{j,i,t} = \gamma_{w,1} \cdot (\gamma_{w,2})^i \cdot c_{j,i,t} \quad (7.6)$$

The wage function represents an input-based incentive structure: wages depend on individual qualities rather than productivity (which depends on the presence of other employees within the team) and are independent of the qualities or productivity of other employees. Nevertheless, given the relationship between quality and productivity, the wage function allows for marginal productivity wages within hierarchical levels: wages per output are independent of the qualities of the employees.

Comparisons with other employees are only made when internal promotions occur (this will be discussed later on). If employees get promoted (which is modelled as a decrease in hierarchical level i), their wages increase discrete rather than continuous, which is in line with tournament theories on incentive structures (Lazear, 2000). Whether this wage increase exceeds the productivity increase that is associated with promotion, depends upon the size of the parameters $\gamma_{w,2}$ and $\gamma_{q,2}$.

Finite firm size

Coase (1937) concluded that enterprises have a finite size due to positive transaction costs. This is also the case for our model: in the absence of any transaction costs, firm size is limited by the size of the market only (which is infinite, since we assume perfect competition). Transaction costs are necessary to ensure both a finite number of hierarchical levels and a finite team size. This effect is realized by modelling the production technology and transaction costs in such a way that the supply curve becomes upward sloping.

Adjustment costs

Until now, we discussed the costs and benefits of *having* subordinates. A major feature of our model is that it contains costs for *changing* the number of subordinates as well. Adjustment costs arise if the optimal number of subordinates differs from the actual number:

$$\begin{aligned} AC(n_t, n_{t-1}^*) = & -fr(n_t, n_{t-1}^*) \cdot I(n_t - n_{t-1}^* < 0) + si \cdot \min(n_t - n_{t-1}^*, n^{int}) + \\ & + se \cdot \max(n_t - n_{t-1}^* - n^{int}, 0) \cdot I(n_t - n_{t-1}^* > 0), \end{aligned} \quad (7.7)$$

with n^{int} the number of potential internal candidates for the job (defined as the number of employees at the next lower level), and $I(.)$ the indicator function. The adjustment costs include firing costs (fr), internal search costs (si) and external search costs (se), and are exogenous to the model.

In the case of superfluous employees, the employees having the lowest qualities are fired. The firm must pay firing costs for each fired employee. If the enterprise has a staff shortage, it has to fill vacancies by searching for suitable employees. The enterprise searches, first, among the employees currently employed in other jobs at the business. We assume the supervisor has insight in the qualities of the employees in the next lower rank in the hierarchy (perfect information). Second, if the capacities required are not available within the enterprise, the supervisor may decide to recruit a new employee. This necessitates an external search procedure that bears a higher cost level. External applicants (i.e. their age Age_{jt} and quality qA_{it}) are drawn from a random distribution; the enterprise has no influence on the arrival of candidates. This mimics, in a way, incomplete information.

This process is captured by the following equations:

$$qA_{it} \sim UNIF(qlb_{it}, qub_{it}), \quad (7.8)$$

$$qlb_{it} = \gamma_{qlb,1} \cdot (\gamma_{qprob,2})^i,$$

$$qub_{it} = \gamma_{qub,1} \cdot (\gamma_{qprob,2})^i,$$

$$Age_{jt} \sim UNIF(alb_{it}, aub_{it}), \quad (7.9)$$

$$alb_{it} = \gamma_{alb,1} \cdot (\gamma_{aprob,2})^i,$$

$$aub_{it} = \gamma_{aub,1} \cdot (\gamma_{aprob,2})^i,$$

The “baseline” minimum requirements that applicants have to meet are given by:

$$mq_{it} = \gamma_{mq,1} \cdot (\gamma_{mq,2})^i, \quad (7.10)$$

For an internal applicant, the minimum requirements are higher than the baseline:

$$mq_{i,t}^{int} = (1 + \gamma_{RQIE}) \cdot mq_{i,t}, \quad (7.11)$$

while for an external applicant, the minimum requirements are below the baseline:

$$mq_{i,t}^{ext} = (1 - \gamma_{RQTR}) \cdot mq_{i,t}, \quad (7.12)$$

If an external candidate meets these minimum requirements, but fails to meet the baseline requirements (7.10), the candidate must take a training course, at a certain cost. If neither the internal nor external applicants meet their minimum requirements, the job remains vacant.

Operation of the simulation model

Optimisation of the profits of the entrepreneur and his search for subordinates are the first two steps in the operation of the simulation model. The third step is that for each

filled job, *i.e.* for each subordinate, we repeat the optimisation and search procedure, by taking into account the central assumption: each employee takes independent decisions on whether he works on the production of output, on the supervision of subordinates, or a combination of both. The optimal number of subordinates is independent from the decisions made at other ranks and in other branches in the hierarchy. Given that the number of employees is finite if internal transaction costs are (sufficiently) positive, the number of repetitions of steps 1 and 2 is finite. This makes it possible to delineate the enterprise by number of employees, organizational structure, generated output and number of unfilled vacancies (step 4 in Table 7.1).

Table 7.1 Set-up of the simulation model

Step	Proces
1	Determination of optimal number of subordinates (per supervisor, per time period)
2	In the case of vacancies: search for employees - promotion of insiders (causes vacancy chains); - recruitment of outsiders (training might be necessary). In the case of superfluous workers: dismiss the least qualified subordinates (the result of this step might be that there remain unfilled vacancies)
3	Perform steps 1 and 2 for each subordinate until reaching the rank where the (optimal) number of subordinates equals zero
4	Determine the number of employees, production (optimal, actual), hiring, firing, (flows, cost) and organizational structure of the enterprise
5	- random quits will occur; - there will be an increase in the experience of the employees who stay (“learning by doing”); - repeat steps 1 to 4 for the following period.

After steps 1 to 4, we obtain the hierarchical set-up of the enterprise at the onset of a period. All workers in the hierarchy remain at their jobs for (at least) one period and produce output during this period. At this point, a number of functions specify the relations between successive periods. At the end of the period, a random number of employees decide to quit the company. Here, we may think of workers who find jobs elsewhere, or workers who have other reasons to leave the labour force. The probability that an individual employee at hierarchical level i will remain with the firm is defined as $(1 - \gamma_{QUIT})^i$. A fraction of the employees will retire; we impose a mandatory retirement age γ_{RETR} . Furthermore, employees may get dismissed if their qualities do not meet minimum requirements. This is possible only for employees who were recruited at the beginning of the period, and needed a training course to enhance their qualities. If, at the end of the year, their quality is still below the baseline minimum requirements, they will be dismissed.

For each worker who does not quit or retire, the passing of time generates an increase in their human capital (“learning by doing”). This is implemented as an increase in their personal measure of quality. The effect depends on the tenure in the current job and has a random component: $qual_{j,t+1} = qual_{jt} \cdot (1 + 2 \cdot (\frac{1}{2})^{ten_{Jjt}} \cdot U)$, where ten_{Jjt} is the tenure in the current job and U a random factor drawn from a uniform distribution: $U \sim UNIF(0, \gamma_{GRWE})$.

The result of quits, retirements and fires is the opening of vacancies at the old positions. Instead of immediately searching for candidates who may fill these vacancies (and the

unfilled vacancies remaining from the previous search process), we return to the optimisation process (step 1) to determine whether it is optimal to search for employees to fill the vacancies, or whether it is best to close the vacancies altogether. The next steps in the modelling algorithm are conducted successively, as outlined above.

Calibration of the model

The parameters of the model are calibrated upon the scarcely available empirical evidence. Our baseline calibration generates a benchmark representative firm whose flow characteristics (quits, fires, and internal and external worker flows) mimic the results found in a study by Hamermesh et al. (1996). In this chapter we present estimates of the annual worker flows in the Netherlands in 1990, drawn from a stratified sample of about 1,000 enterprises with 10 or more employees⁶⁹. The selection of the model parameters, to generate our benchmark firm, is based on case studies on the internal economics of enterprises by Baker et al. (1994) and Van Gameren et al. (1999). Both case studies utilize personnel records of a large enterprise, and specify how the internal structure such as the span of control and the wage scales of the business are organized. The calibration of search costs is based on linear approximation of the quadratic adjustment cost function of Pfann and Verspagen (1989). Their results suggest that in the case of small adjustments, recruitment costs seem to be somewhat higher than the firing costs, while for more expansionary firms, hiring costs increase exponentially. We assume that external search is more expensive than internal search, which implies that the first option to fill vacancies is through internal moves.

Simulation results with our calibrated model of a representative business are shown in Table 7.2. The flows are based on simulations over 50 periods (or years)⁷⁰, and replicated 100 times to account for the random processes incorporated in the model. Averages are taken over the last 25 years since during the initial years, the business grows to its optimal size⁷¹. The simulation results can be compared with the results of Hamermesh et al. (1996) that are presented in the column “target size”.

Table 7.2 indicates that average firm size hardly fluctuates between the various simulations: the standard deviation of the number of employees is small. A closer inspection of the simulation results provides insights into the hierarchical structure. The employer hires four employees (say heads of units or plants). Each of these employees wants to hire five subordinates (say heads of branches), and is eventually able to keep these positions filled each period. These subordinates (20 in total) also want to hire five employees each, but they are not always able to keep these positions occupied (due to quits, retirements or dismissals, and the absence of internal candidates). It is only at this lowest level that the simulated enterprises show any variation in number of employees. Apparently, the differences in the human capital stock of the simulated enterprises is not large enough to change the optimal number of subordinates and levels between enterprises.

⁶⁹ Allaart et al. (2000) use a more recent data set for the Netherlands (concerning 1996), and find very similar worker flow estimates.

⁷⁰ In the model, a period is defined as a year.

⁷¹ At the beginning of the first year, each firm has one employee (i.e. the employer).

The table shows that the random processes that hit the enterprise cause more variation in some of the labour flows than in the labour stock (the number of employees). Our calibrated benchmark model is able to reproduce the target values with respect to the inflow and outflow of employees reasonably well. Its distribution of total outflow over outflow from existing jobs (quits/retirements and direct fires⁷²) and outflow from destroyed jobs seems less successful. Jobs are being destroyed (the annual job destruction rate is 1.2%), but most employees whose jobs are destroyed can find employment elsewhere in the enterprise. It is, however, important to notice that the target sizes taken from Hamermesh et al. (1996) represent a growing business: total inflow (11.9%) exceeds total outflow (10.1%). Our calibrated benchmark model represents a business in equilibrium, with inflow and outflow being equal. Hamermesh et al. (1996) find that the dismissal rate (both direct fires and outflow from destroyed jobs) is lowest for enterprises with constant employment level, which suggests that the target size for outflow from a destroyed job is set too high.

Table 7.2 **Simulation results**

Type and direction of worker flows	Simulation results		Target size
	Mean	Standard deviation	
Number of employees in the firm	123	1.90	136
<i>Inflow</i>			
Hire to a newly created job (%)	2.0	1.70	3.2
Hire to an existing job (%)	7.8	3.39	8.7
<i>Outflow</i>			
Quits/retirements (%)	7.6	2.97	8.2
Direct fires (%)	1.9	1.53	
Outflow from a destroyed job (%)	0.35	0.66	1.9
<i>Internal mobility</i>			
To a newly-created job (%)	0.04	0.24	1.2
To an existing job (by direct subordinate) (%)	0.2	0.51	2.2
To an existing job (from other team) (%)	2.2	1.82	

source: target sizes are taken from Hamermesh et al. (1996), table 1, with the exception of the number of employees in the firm, which is taken from Van Gameren (2000), table 6.3. All percentages denote percentages of employment. The sample standard deviations are calculated over the last 25 periods.

Target values for internal flows are the most difficult to reproduce in the calibration procedure. Internal mobility towards new jobs is very low: once a business has stabilized, new jobs are almost exclusively created at the lowest rank in the hierarchy (where vertical mobility is, by definition, not possible). Vacancies that arise at higher levels are mostly filled by internal mobility; external inflow occurs almost exclusively at the lowest rank.

⁷² Direct fires occur, when employees are fired because their qualities are insufficient. These employees directly leave the firm, whilst their jobs remain intact. Indirect fires occur when jobs are destroyed; these employees can apply for vacancies elsewhere in the firm.

7.4 Labour productivity, specialization and firm size

The simulation model combines elements from various approaches to explaining firm size. Specific model parameters represent the microeconomic approach (wage costs, benefits of specialization), transaction cost approach (costs of specialization, loss of control and supervision), equilibrium search theory (search costs, requirements for candidates, quit rate) and human capital of individual employees (variation in qualities of external candidates, effects of learning by doing and training).

The following two sections examine the relevance of these approaches by assessing their impact on firm size and labour flows. This section focuses on the microeconomic and transaction cost approaches, by studying the impact of changes in labour productivity and costs and benefits of specialization on firm size and labour flows. Four different indicators are used to characterise the size of the simulated firms⁷³:

- The average firm size of firms that survive for a certain number of years; the model allows for the possibility that enterprises do not survive after 50 years, therefore the average is calculated over all surviving enterprises.
- The survival rate; the fraction of all simulated firms that survive after 50 years. Firms may not survive either because the original owner cannot find a successor, or because at a certain point all employees leave the business (through quit or fire). Note that the survival of firms only depends on internal factors, and not on market dynamics or the (re)actions of other firms.
- The within-standard deviation of firm size: a measure of the average standard deviation within each firm, over all periods of time: it indicates how an individual firm differs in size over time.
- The between-standard deviation of firm size: a measure for the difference in average firm size between enterprises: it indicates how different firms differ in size at a certain time.

Labour productivity and firm size

Our first simulation examines the impact of changes in the average labour productivity. To be more exact, we manipulate $\gamma_{q,1}$, which represents the annual production of a new employee with average quality (without any loss of control). The calibration discussed in the previous section resulted in a business with an average labour productivity of 150 units a year. Figure 7.1 shows the relationship between average labour productivity and firm size. If average labour productivity is too low and does not cover (transaction) costs, entrepreneurs don't recruit any employees, and enterprises do not survive after 50 years. At a certain threshold point⁷⁴, labour productivity becomes high enough to make it profitable to recruit employees, and a level is added to the firm. The survival rate of enterprises immediately shifts to nearly 100%.

A further increase in firm size only occurs if productivity becomes high enough to add a third level to the firm, and later on a fourth level⁷⁵. Changes in average labour produc-

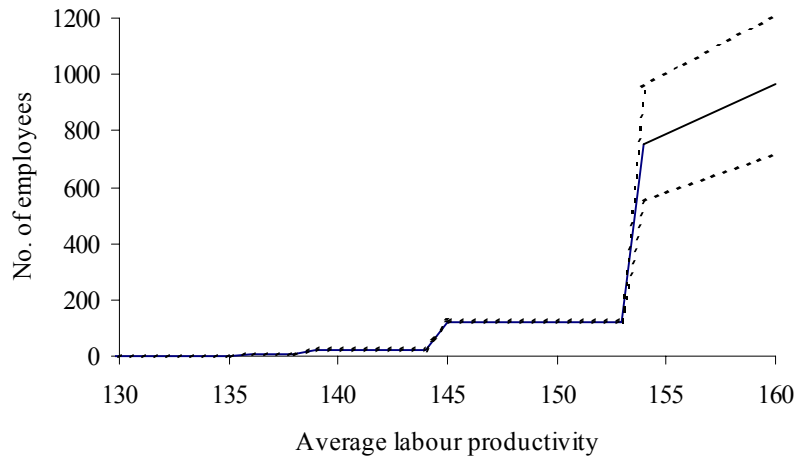
⁷³ With the exception of the survival rate, all characteristics are calculated over the last 25 periods.

⁷⁴ $\gamma_{q,1} = 136$.

⁷⁵ $\gamma_{q,1} = 139, 145$, respectively.

tivity have no effect on the size of the teams. Additional profits from increased productivity are not large enough to justify the costs of increased horizontal and vertical coordination that are associated with an expanding team size.

Figure 7.1 Relationship between firm size and average labour productivity



note: the dotted lines represent average firm size $\pm 2 \times$ the standard deviation of firm size.

This changes however, if average productivity is increased further. A small increase at the next threshold point (from 155 to 156) now has two effects. An additional level is added to the firm, which increases average firm size. Moreover, firms now also differ in the sizes of their teams. Not only at the fifth level, but at all levels of the hierarchy. Variation in team size increases with hierarchical level. This results in a large variation in firm size. Beyond this threshold point, average firm size is determined by team size, and not so much by the number of hierarchical levels (for example: increasing the average production level from 155 to 160 raises average firm size, whilst the number of hierarchical levels remains the same).

Figure 7.2 illustrates the variance in firm size for enterprises with five hierarchical levels, both within individual businesses over time (measured by the within-standard deviation) and between enterprises (measured by the between-standard deviation). It shows the development of four different simulated firms: a firm with an average within-deviation, the firm with the highest within-deviation, and the firms with - on average - the most and least employees. The number of employees often changes; variation in inflow (and internal mobility) far exceeds the variation in outflow rates.

This intriguing change in the working of the model may be explained as follows. First of all, it is important to realize that this variation in firm size is entirely due to the heterogeneity in available human capital. This follows from the fact that all stochastic elements in the simulation model are related to the human capital of individual employees: qualities of new applicants, returns to training, effects of learning by doing and voluntary quits (voluntary quits result in a loss of human capital, and open an opportunity to gain new human capital).

A supervisor will hire employees as long as marginal benefits of the additional production exceed marginal costs. The marginal benefits of an additional unit of production are

by definition equal to output price, which is normalized to 1. While marginal benefits are independent of the available human capital, marginal costs are not. The marginal costs consist of marginal wage costs and marginal transaction costs (supervision costs and adjustment costs). We assume marginal productivity wages: wages per output are independent of human capital. In contrast, supervision costs per unit of output are negatively related to the amount of human capital: more human capital implies both higher production and lower supervision costs⁷⁶.

Figure 7.2 Four different “large” enterprises



In short: human capital influences marginal transaction costs of additional production and, therefore, the decision on how many employees to hire. With each additional level, transaction costs (which depend on human capital available) increase relative to wage costs⁷⁷, and the costs of managing the hierarchical firm become more important. This suggests that with large (5-leveled) firms, personnel management (hiring and selection of new employees and internal mobility of incumbent employees) and organizational changes may influence firm size.

Specialization and firm size

Firm size is determined by the number of workers within each team, as well as the number of hierarchical levels. Williamson (1967) modelled the number of workers within each team as an exogenous variable: the span of control. In his model, increasing the span of control resulted in an increase in the number of levels, so that the effect on firm size is twofold.

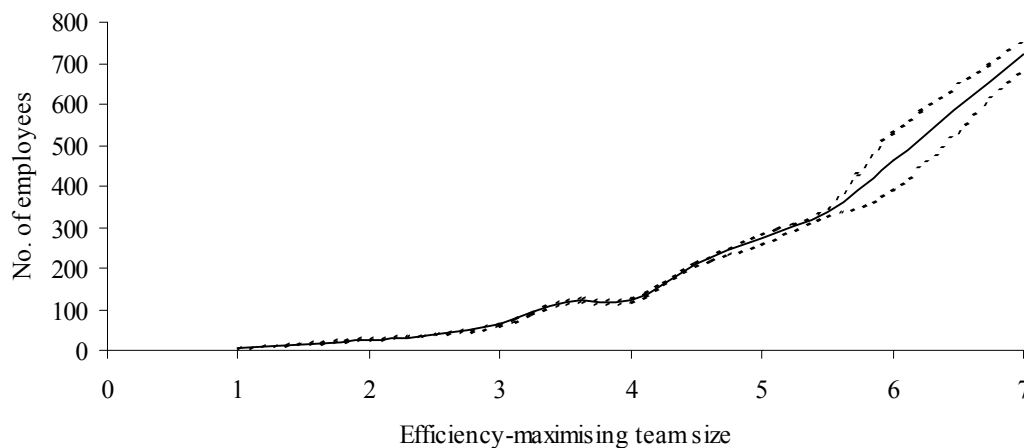
⁷⁶ The marginal adjustment costs of an additional unit of production are also negatively related to human capital, but less strong than marginal supervision costs. This is because adjustment costs are independent of human capital. A formal derivation of marginal costs and benefits is presented in the appendix to this chapter.

⁷⁷ This is a consequence of the calibration process, which resulted in $\gamma_{fp,2} > \gamma_{w,2}$.

In our model, the span of control is instead endogenized by introducing the costs and benefits of specialization. The net contribution of an individual to the total production of its team is the difference between the benefits of specialization and the costs of horizontal coordination. This combined effect is modelled as a parabolic function $a(n)$, along the lines of Becker and Murphy (1992). Hence, we have an endogenous span of control determined by the efficiency-maximizing team size (defined as the number of employees for which $a(n)$ reaches its maximum, and the average net contribution per employee is optimal). This efficiency-maximizing team size may be manipulated by simultaneously changing costs and benefits of specialization.

Increasing the efficiency-maximizing team size from 1 to 7 employees increases the average firm size from 4 to more than 700 employees (see figure 7.3). This is exactly according to the expectations of the traditional microeconomic approach: economies of scale (or specialization) have a positive impact on firm size. Contrary to Williamson (1967), we find that increases in the efficiency-maximizing team size have no effect on the number of hierarchical levels.

Figure 7.3 The relationship between firm size and the efficiency-maximizing team size



note: the dotted lines represent the average firm size $\pm 2 \times$ the standard deviation of firm size.

The efficiency-maximizing team size is independent of wage and transaction costs. As a result, the (simulated) profit-maximizing team size is not equal to the efficiency-maximizing team size. In fact, the simulated team size differs between hierarchical levels (since transaction costs differ between levels). With the exception of the highest level, the profit-maximizing team size is larger than the efficiency-maximizing team size.

7.5 Different approaches to explaining firm size

This section examines the effects of changes in several model parameters, for both a small (25 employees) and a large (600 employees) benchmark firm.

Simulating small and large enterprises

The small firm is simulated by selecting the value for average productivity. This yields an enterprise with three levels, with approximately 25 employees (see Table 7.3). The large enterprise is simulated by enhancing average productivity so that profit maximization yields an enterprise with five levels. Adding a fifth level results in higher standard deviations of firm size, both within and between enterprises (see Table 7.4). Simulation experiments show that this effect does not only occur when average labour productivity is enhanced: changes in other parameters may also result in large enterprises with five levels and high within-/between-standard deviations.

Table 7.3 Simulation results for a small benchmark firm

Type and direction of worker flows	Average	Within-standard deviation	Between-standard deviation
Survival rate (%)	99		
Start up length (years)	4		
Number of levels	3	0	0
Number of employees in the firm	24.5	0.72	0.16
<i>Inflow</i>			
Hire to a newly created job (%)	1.8	0.67	0.11
Hire to an existing job (%)	7.2	1.29	0.25
<i>Outflow</i>			
Quits/retirements (%)	6.4	1.22	0.14
Direct fires (%)	2.3	0.74	0.16
Outflow from a destroyed job (%)	0.4	0.29	0.05
<i>Internal mobility</i>			
To a newly-created job (%)	0	0.02	0.00
To an existing job (by direct subordinate) (%)	0.6	0.40	0.01
To an existing job (from other team) (%)	1.0	0.50	0.03

The average rates of in- and outflow are comparable for small and large enterprises: inflow is 9% of total employment for small and 11% for large enterprises. The difference is caused by the difference in average quit rates between small and large enterprises (because the quit rate differs between hierarchical levels, large enterprises have *ceteris paribus* higher quit rates). The nature of the flows differs, however. For small businesses, the majority of inflow concerns existing jobs, whilst for large enterprises it is mostly inflow into newly created jobs. There are fewer fires in large than in small businesses. The outflow from destroyed jobs is very similar.

The internal mobility is clearly higher for large enterprises as they have more opportunities for job movers than small businesses have. This is due to the larger pool of incumbent workers with sufficient qualifications. This result is in accordance with the findings of Hamermesh et al. (1996) and Hassink (1996).

Allaart et al. (2000) have calculated worker flows for different size classes. This enables us to compare our simulation outcomes with some empirical information. Allaart et al. (2000) find that in- and outflow of workers vary less with size class than internal flows do. Particularly for enterprises with 20-49 employees they find that inflow equals 12.5%

of the number of employees, outflow 10.5% and internal flow 2.3%. For enterprises with more than 500 employees, these volumes are 12.6%, 11.1% and 6.9%, respectively. These results are comparable with Hassink (1996), who finds internal labour flows of 2.4% for businesses with less than 100 employees, and 4.9% for enterprises with more than 100 employees. Our model reproduces the (small) difference in outflow between small and large enterprises rather well, but it underestimates internal mobility for small businesses, and overestimates internal mobility for large enterprises.

Table 7.4 **Simulation results for a large enterprise**

Type and direction of worker flows	Average	Within-standard deviation	Between-standard deviation
Survival rate	99%		
Startup length (years)	19		
Number of levels	5		
Number of employees in the firm	792	44.2	93.9
<i>Inflow</i>			
Hire to a newly created job (%)	8.6	48.2	25.4
Hire to an existing job (%)	2.4	15.7	16.0
<i>Outflow</i>			
Quits/retirements (%)	9.3	9.3	8.5
Direct fires (%)	0.9	5.0	1.0
Outflow from a destroyed job (%)	0.6	13.1	2.7
<i>Internal mobility</i>			
To a newly created job (%)	3.5	21.6	18.6
To an existing job (by direct subordinate) (%)	0.1	0.8	0.3
To an existing job (from other team) (%)	9.4	16.5	27.4

Sensitivity analysis

By way of sensitivity analysis, our final set of simulation experiments illustrates the influence of parameter changes on size of the labour stock and flows of our small and large benchmark firm. These parameter changes represent various options for changing the performance of the business. They may be associated with the various theoretical approaches to explain heterogeneity amongst enterprises, which are combined in the model. The aim of these simulations is to give some indication, both in the case of a small business and of a large enterprise, of the relative impact (on firm size) of various ways in which enterprises may adapt their production process, internal organization and personnel management.

Tables 7.5 and 7.7 show the effect on the characteristics of the size and labour flows of the simulated firms⁷⁸, when the parameter changes represent an increase in the performance of the business. Tables 7.6 and 7.8 show the effect of opposite changes in these model parameters. As the response of our model to various shocks and parameter

⁷⁸ Since our model represents firms in equilibrium, outflow and inflow rates are virtually identical. We therefore only present the inflow rates in our tables.

changes is highly non-linear, mainly as a consequence of ratchet effects (change of number of levels), it appears that in some cases, small businesses react less strongly to changes than large enterprises do. Therefore, we have conducted our simulation experiments with larger parameter changes for the small business (tables 7.5 and 7.6) than for the large enterprise⁷⁹ (tables 7.7 and 7.8).

Table 7.5 Changing parameter values to stimulate performance of small businesses

		Wages		Specialization		Vertical transaction costs		
	bench mark	wagc	wagl	benefits	costs	loss of control	fgpc	fgpl
		-5%	-2.5%	+2.5%	-5%	-1%	-10%	-2.5%
Survival	99%	100%	99%	100%	99%	100%	100%	100%
Size (nr. empl)	24.5	24.5	122.9	123.8	151.0	122.7	122.9	122.8
Within st.dev.	0.7	0.7	1.8	2.3	4.8	1.7	1.5	1.5
Between st.dev.	0.2	0.1	0.4	0.7	6.1	0.3	0.3	0.3
Inflow	9.0%	9.0%	9.8%	9.7%	9.5%	9.8%	9.8%	9.9%
Internal mobility	1.6%	1.5%	2.4%	2.5%	4.5%	2.3%	2.0%	2.0%

		Search costs	Search requirements			Quit rate	Human capital	
			reqc	reql	rqie		pdfu	grwe
		-10%	-35%	-25%	-50%	-2%pt	+30%	+75%
Survival	99%	100%	100%	100%	100%	100%	100%	100%
Size (nr. empl)	24.5	122.1	24.5	24.4	24.5	24.6	24.5	24.6
Within st.dev.	0.7	1.7	0.7	0.7	0.7	0.6	0.7	0.7
Between st.dev.	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.1
Inflow	9.0%	9.7%	7.1%	6.8%	9.2%	5.8%	7.7%	8.5%
Internal mobility	1.6%	2.6%	3.3%	3.7%	1.6%	1.6%	2.3%	1.8%

⁷⁹ For example: for large firms, the parameter on the effects of learning by doing and training (grwe) was changed with +/- 10% (tables 7 and 8). For small firms, this change had no effect. Instead, tables 5 and 6 report the effects of changes of +/- 75%.

Table 7.6 Changing parameter values to hamper performance of small businesses

	bench mark	Wages		Specialization		Vertical transaction costs		
		wage	wagl	benefits	costs	loss of control	fgpc	fgpl
		+5%	+2.5%	-2.5%	+5%	+1%	+10%	+2.5%
Survival	99%	100%	100%	100%	100%	100%	100%	99%
Size (nr. empl)	24.5	4.8	4.9	4.9	4.8	4.9	4.9	24.4
Within st.dev.	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.7
Between st.dev.	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Inflow	9.0%	9.5%	9.2%	8.6%	9.8%	9.8%	9.1%	9.2%
Internal mobility	1.6%	1.5%	1.5%	1.4%	1.5%	1.4%	1.4%	1.7%

	bench mark	Search costs	Search requirements			Quit rate	Human capital	
			reqc	reql	rqie		pdfu	grwe
		+10%	+35%	+25%	+50%	+3% pt	-30%	-75%
Survival	99%	100%	6%	49%	69%	99%	68%	57%
Size (nr. empl)	24.5	4.8	23.4	3.8	24.4	24.0	23.6	24.2
Within st.dev.	0.7	0.4	1.2	1.4	0.8	1.0	1.1	0.9
Between st.dev.	0.2	0.1	0.4	0.7	0.1	0.2	0.3	0.2
Inflow	9.0%	9.9%	13.0%	31.3%	9.3%	18.3%	15.6%	12.4%
Internal mobility	1.6%	1.5%	1.6%	3.7%	1.4%	2.4%	2.1%	5.0%

Table 7.7 Changing parameter values to stimulate performance of large enterprises

	bench mark	Wages		Specialization		Vertical transaction costs		
		wage	wagl	benefits	costs	loss of control	fgpc	fgpl
		-2.5%	-2.5%	+2.5%	-2.5%	-0.5%	-5%	-2.5%
Size (nr. empl)	792	884.6	1020.8	1176.3	1171.6	849.7	837.9	848.6
Within st.dev.	44.2	44.7	47.3	30.9	29.1	44.9	44.5	40.8
Between st.dev.	93.9	112.5	115.3	1.9	40.5	59.9	99.1	97.2
Inflow	11.0%	10.7%	10.6%	10.6%	10.5%	10.9%	10.9%	10.8%
Internal mobility	13.0%	14.2%	12.0%	7.9%	7.6%	14.7%	14.3%	14.5%

		Search costs	Search requirements			Quit rate	Human capital	
			reqc	requ	rqie		pdfu	grwe
		-5%	-10%	-10%	-10%	-2% pt	+10%	+10%
Size (nr. empl)	792	849.6	801.0	817.7	796.5	910.8	809	845
Within st.dev.	44.2	42.9	44.0	46.5	43.4	43.0	44.5	47.0
Between st.dev.	93.9	107.0	97.7	108.6	86.2	34.3	72.0	42.1
Inflow	11.0%	10.8%	10.7%	10.0%	10.9%	4.2%	10.6%	11.0%
Internal mobility	13.0%	15.7%	14.1%	14.6%	13.7%	12.2%	14.4%	17.5%

Table 7.8 Changing parameter values to hamper performance of large enterprises

		Wages		Specialization		Vertical transaction costs		
	bench mark	wagc	wagl	benefits	costs	loss of control	fgpc	fgpl
		+2.5%	+2.5%	-2.5%	+2.5%	+0.5%	+5%	+2.5%
Size (nr. empl)	792	709.8	122.7	122.2	609.8	123.6	779.5	123.3
Within st.dev.	44.2	34.3	1.6	1.6	4.2	2.2	43.1	2.1
Between st.dev.	93.9	95.7	0.3	0.4	0.7	0.5	88.7	0.6
Inflow	11.0%	10.8%	9.9%	9.8%	10.5%	9.9%	10.9%	9.8%
Internal mobility	13.0%	10.3%	2.3%	2.5%	3.9%	2.5%	13.6%	2.7%

		Search costs	Search requirements			Quit rate	Human capital	
			reqc	requ	rqie		pdfu	grwe
		+5%	+10%	+10%	+10%	+3% pt	-10%	-10%
Size (nr. empl)	792	123.8	800.3	736.4	806.5	622.7	758.9	666.1
Within st.dev.	44.2	2.1	38.8	32	43.6	15	37.9	26.6
Between st.dev.	93.9	0.5	82.4	100	79.8	19.1	101.9	83.1
Inflow	11.0%	9.8%	11.1%	13.2%	10.8%	24.6%	11.2%	10.7%
Internal mobility	13.0%	2.4%	13.7%	9.4%	13.8%	7.3%	11.7%	6.3%

These simulation exercises lead to the following conclusions with respect to differences between small and large enterprises:

- Small businesses react less strongly to changes in their (internal and external) environment than large enterprises do.
- Large enterprises always survive the 50-year period of our simulations (therefore, the survival rate has not been reported in tables 7.7 and 7.8). For small businesses, this is not the case.
- Variation in firm size is always due to variation in team size (at all levels), never in number of levels. The number of hierarchical levels is determined by model parameters representing the production and management of the business, and not by the stochastics of the internal and external labour markets.
- As long as enterprises have no more than four levels, firm size shows very little variation over the simulations. In contrast, there is much more variation in businesses with five levels. This variation is ultimately caused by the variation in human capital of individual employees. Apparently, the factors that cause enterprises to become so large that their organization consists of five hierarchical levels, also enhance the relationship between optimal firm size and human capital of their (incumbent) employees.

With respect to the technicalities of the production process (wage costs, costs and benefits of specialization), the following conclusions emerge from the simulation experiments:

- Changes in the respective parameter values have a clear effect on the number of employees. For small businesses, the number of employees changes because a hierarchical level is added or removed. For large enterprises, levels may be removed, but a sixth level is never added to the firm.
- The benchmark model of the large enterprise shows a substantial variation of average size between firms, which is caused by the heterogeneity of the labour force. Changes in the benefits and costs of specialization may, however, make the heterogeneity of employees become irrelevant again (as is the case for the small businesses). Enhancing the benefits of horizontal coordination by 2.5% results in a 48% increase of average firm size, while the between-firm standard deviation reduces almost to nil (Table 7.7). A 2.5% increase of the costs of horizontal coordination lead to a 23% decrease of average size (without removing a hierarchical level), and again the between-firm standard deviation becomes very small (Table 7.8).

With respect to the features of equilibrium search theory (search costs, requirements for candidates, quits) that are incorporated in the model, the simulation experiments of this sensitivity analysis give rise to the following conclusions:

- Search/adjustment costs have a substantial influence on the equilibrium size of the firm: increasing costs have a negative effect on the number of employees, both for small and for large enterprises.
- Factors that determine the quality requirements for internal and external candidates have a different effect on small and large enterprises: for small businesses, they influence the survival rate (and the size of the inflow), and for large enterprises, they influence the number of employees.

- The observed variation in firm size for the large enterprises depends strongly on the quit rate: if employees do not quit the company (except when retiring), the between-firm standard deviation is reduced from 93.9 to 19.1.
- An increase in the quit rate leads to a rise in direct dismissals. The underlying mechanism is that an increase in quit rate results in a rise of external recruitments. With a constant fraction of new employees being dismissed after a year (because their qualities turned out to be insufficient), an increase in external recruitments leads to a rise in outflow by direct fires.

Finally, with respect to human capital of individual employees (variation in qualities of external candidates, effects of learning by doing and company-provided training), the following conclusions are in order.

- Decreasing the available quality and/or lowering the effects of learning by doing and the returns to training has a negative effect on the survival rates of small businesses and on the average size of large enterprises.
- For small businesses, the quality of individual employees is negatively related with inflow (and outflow): if the average quality is higher and/or training becomes more effective, then in- and outflow rates decline. For large enterprises, the quality of individual employees has no effect on inflow rates.
- The relations with internal mobility are less clear for small businesses than for large enterprises. For large enterprises, there is a positive relationship with internal mobility. With small businesses, both increases and decreases in the relevant model parameters seem to have a positive effect on internal mobility rates.

7.6 Conclusions

By using a calibrated simulation model, this chapter provides a quantitative view on the importance of various determinants of firm size. Although the model has a neo-classical background in the sense that optimal firm size is determined by profit maximization, it combines a number of other approaches from economic literature which aim at explaining firm heterogeneity and variations in firm size. In this respect, our model pays ample attention to the various forms of transaction costs and derives the optimal size of the firm from the criterion that in equilibrium marginal internal costs are equal to marginal external costs. Moreover, the model describes the interaction between external and internal labour flows; and in doing so, it shows how the performance of the firm and, therefore, its size is influenced by aspects of human capital and personnel management, such as hiring costs, firing costs, search costs, wage policy, training, job matching and setting requirements for worker qualification. In fact, our modelling exercise fully appreciates the observation by Conlisk (1996, page 675) that “a central insight is that the existence, size, structure and workings of organizations are critically shaped by a need to economize on various transaction costs”. Our model is capable of reproducing all these insights, and the experiments with the model show the relative effectiveness of such economizing.

The sophistication of the model does not only enable us to explain size differences between enterprises of different sectors (which had already been explained by microeconomic theory) but, also, to explain why enterprises operating in similar environments may differ in size. The model shows that there are two sources for such size differences of firms operating in similar environments. The first source is differences in transaction

costs that may lead, as theory predicts, to size differences between firms that operate otherwise in the same circumstances. Our simulation experiments also show that the elasticity of transaction costs - i.e. the difference in firm size evoked by a 1% difference in transaction costs - depends on firm size itself.

The second source of size differences between firms of the same sector is heterogeneity of labour supply and the reaction of personnel management on such heterogeneity. Even when transaction costs are the same for similar firms, their sizes may differ due to the qualities of incumbent workers. The impact of this effect appears again to be different in small businesses and large enterprises. The relative influence that labour heterogeneity has on firm size depends crucially on the ratio between transaction costs and wage costs. In our calibrated model, small businesses with a relatively flat organization and few hierarchical levels face relatively few transaction costs, but transaction costs gain importance when the number of hierarchical levels rises and intra-firm bureaucracy increases. Therefore, the impact of labour heterogeneity (and the scope for HRM) on firm size is more severe in large enterprises than in small businesses. Within small firms, labour heterogeneity has a different kind of impact: differences in qualities of individual employees have no impact on the number of employees (given that the firm survives), but on the continuity and survival of the firm instead.

Transaction cost may be categorized into coordination costs and costs of motivation. Coordination costs are indicators for the quality of management and for how well structured the organization of the enterprise is. In smaller businesses, where the owner is both entrepreneur and manager, coordination costs also relate to entrepreneurial qualities. The model simulations show that the success and survival probabilities of new businesses depend heavily on these entrepreneurial qualities. Marlow and Patton (1993, page 59) report that “it is emerging that effective management of employees is also a critical element in SME survival”. Our simulation results support their finding.

The specification and calibration of our model needed a number of assumptions. The model would therefore benefit from future research into these assumptions. For example, the specification of the wage equation is based on the assumption of marginal productivity wages within hierarchical levels, and elements from tournament theory (Lazear, 2000) between hierarchical levels. Insights from personnel economics, with its studies on the rationale of various incentive structures (Lazear, 1989, 2000), can be used to determine under which circumstances the current specification of the wage equation is optimal, and which alternative specifications would be feasible.

In addition, our model needed a number of assumptions on both the shape and parameter values of the production process and the transaction costs associated with company management. Although we have exploited as much as possible existing empirical evidence for specifying and calibrating the model, it is obvious that considerable part of the information that is crucial for the working of the model, is still lacking. E.g. much more empirical data are needed in order to come to a more robust specification of the relationship between the span of control, vertical and horizontal transaction costs and optimal team size. The sensitivity analysis of the previous section indicates that these data, and data on human capital and costs associated with hiring, firing, quitting and training, are essential for a better understanding of the reasons why profit-maximizing businesses differ in size. Collecting these data in individual case studies of enterprises seems an important scope for future research. Our modelling exercise provides a framework for the collection of these data.

Appendix 7.1: The calibrated simulation model

This appendix contains some basic characteristics of the calibrated simulation model. First, the calibrated model parameters of the baseline simulation are provided. Next, the marginal costs and benefits of hiring additional subordinates are derived. For the special case where all employees have the same average quality, we examine under which conditions a positive and finite team size (the profit-maximizing number of subordinates) is guaranteed.

Specification

The benchmark representative firm is based upon the following calibration:

Production:	$\gamma_{q,1} = 150, \gamma_{q,2} = 0.85$
Supervision costs:	$\gamma_{fp,1} = 37.5, \gamma_{fp,2} = 1$
Cooperation:	$\alpha = 0.05625, \beta = 0.45$
Wage:	$\gamma_{w,1} = 175, \gamma_{w,2} = 0.75$
Price:	$p_t = 1$
External search costs:	$se_{it} = 50$
Firing costs:	$fr_{it} = 0.5 se_{it}$
Internal search costs:	$si_{it} = 0.66 se_{it}$
Quality of applicant:	$\gamma_{qlb,1} = 3, \gamma_{qub,1} = 11.6, \gamma_{qprob,2} = 0.87$
Age of applicant:	$\gamma_{alb,1} = 40, \gamma_{aub,1} = 80, \gamma_{aprob,2} = 0.80$
Minimum requirements:	$\gamma_{mq,1} = 10, \gamma_{mq,2} = 0.75, \gamma_{RQIE} = 0.10, \gamma_{RQTR} = 0.20.$
Quit rate:	$\gamma_{QUIT} = 0.02$
Retirement:	$\gamma_{RETR} = 60$
Learning by doing:	$\gamma_{GRWE} = 0.20$

Marginal costs and benefits

The optimal number of subordinates may be determined by comparing the marginal costs (*mc*) and benefits (*mb*) of hiring an additional subordinate. The marginal costs for a (potential) supervisor of hiring an (additional) subordinate are the sum of additional coordination costs, supervision costs, wage costs and adjustment costs. For a supervisor at hierarchical level (*i-1*) who currently employs *N* subordinates ($N \geq 0$), the marginal costs $mc_{i-1,N+1}$ of hiring an additional subordinate are⁸⁰:

$$\begin{aligned} mc_{i-1,N+1} &= \alpha \cdot (N+1)^2 \cdot \sum_{j=0}^{N+1} q_{j,i} - \alpha \cdot N^2 \cdot \sum_{j=0}^N q_{j,i} + fp_{N+1,i} + w_{N+1,i} + AC \\ &= (\alpha \cdot N^2 + 2\alpha \cdot N + \alpha) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot c_{N+1,i} + (2N+1) \cdot \alpha \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot \left(\sum_{j=0}^N c_{j,i} \right) \\ &\quad + \gamma_{fp,1} \cdot (\gamma_{fp,2})^i \cdot (1/c_{N+1,i}) + \gamma_{w,1} \cdot (\gamma_{w,2})^i \cdot c_{N+1,i} + AC \end{aligned}$$

The marginal benefits of hiring an additional subordinate are the sum of the benefits from the additional employee, and the changes in the benefits of the incumbent *N* employees. These changes are caused by changes in the benefits of cooperation if an additional employee would be hired:

$$\begin{aligned} mb_{i-1,N+1} &= (\beta \cdot (N+1) + 1) \cdot q_{N+1,i} + (\beta \cdot (N+1) - \beta \cdot N) \cdot \sum_{j=0}^N q_{j,i} \\ &= (\beta \cdot N + \beta + 1) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot c_{N+1,i} + \beta \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot \sum_{j=0}^N c_{j,i} \end{aligned}$$

If an employee decides to become (or stay) a supervisor, then the profit-maximizing number of subordinates N^* is given by the conditions $mc_{i-1,N^*} < mb_{i-1,N^*}$ and $mc_{i-1,N^*+1} > mb_{i-1,N^*+1}$. The unique solution N^* may be found by finding the solution to $mc_{i-1,N+1} = mb_{i-1,N+1}$ (and rounding off the solution)⁸¹:

$$\begin{aligned} mc_{i-1,N+1} &= mb_{i-1,N+1} \\ \Leftrightarrow & \\ (-\alpha \cdot N^2 - (2\alpha - \beta) \cdot N - \alpha + \beta + 1) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot c_{N+1,i} + & \\ (-2\alpha \cdot N - \alpha + \beta) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot \sum_{j=0}^N c_{j,i} & \\ = \gamma_{fp,1} \cdot (\gamma_{fp,2})^i \cdot (1/c_{N+1,i}) + \gamma_{w,1} \cdot (\gamma_{w,2})^i \cdot c_{N+1,i} + AC & \end{aligned}$$

⁸⁰ The time index *t* is removed from all equations, since it has no relevance for the calculations presented here.

⁸¹ In addition, the first derivative of the marginal costs with respect to the number of subordinates must exceed the first derivative of the marginal benefits.

Team size in firms with homogeneous employees

In the special case where all employees have the same, average quality ($c_{j,i} = 1 \forall j,i$), the equations for marginal costs and benefits become less complicated. The marginal costs equation may be simplified to:

$$\begin{aligned}
 mc_{i-1,N+1} &= (\alpha \cdot N^2 + 2\alpha \cdot N + \alpha) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i + (2N+1) \cdot \alpha \cdot N \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i + \\
 &\quad + \gamma_{fp,1} \cdot (\gamma_{fp,2})^i + \gamma_{w,1} \cdot (\gamma_{w,2})^i + AC \\
 &= 3\alpha \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot N^2 + 3\alpha \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot N + \alpha \gamma_{q,1} \cdot (\gamma_{q,2})^i + \\
 &\quad + \gamma_{fp,1} \cdot (\gamma_{fp,2})^i + \gamma_{w,1} \cdot (\gamma_{w,2})^i + AC \\
 &= \varphi_1 \cdot N^2 + \varphi_1 \cdot N + \varphi_2
 \end{aligned}$$

with $\varphi_k > 0$ for $k=1,2$.

The values of these parameters depend on the hierarchical level i (for notational convenience, the hierarchical level index i has been left out). Both the first-order and second-order derivative with respect to N are positive, so the marginal costs are a strict convex function of the number of incumbent subordinates.

The marginal benefits may be rewritten as:

$$\begin{aligned}
 mb_{i-1,N+1} &= (\beta \cdot N + \beta + 1) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i + \beta \cdot N \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \\
 &= 2\beta \gamma_{q,1} \cdot (\gamma_{q,2})^i \cdot N + (2\beta + 1) \cdot \gamma_{q,1} \cdot (\gamma_{q,2})^i \\
 &= \theta_1 \cdot N + \theta_2
 \end{aligned}$$

with $\theta_k > 0$ for $k=1,2$.

The marginal benefits are now increasing linearly with the number of incumbent subordinates (again, the hierarchical level index i has been left out).

A necessary condition for a finite team size is that $mc_{i-1,N} > mb_{i-1,N}$ for $N \rightarrow \infty$. This condition is always met (given that all model parameters are strictly positive):

$$\lim_{N \rightarrow \infty} \frac{mc_{i-1,N}}{mb_{i-1,N}} = \lim_{N \rightarrow \infty} \frac{\varphi_1 N^2 + \varphi_1 N}{\theta_1 N} = \lim_{N \rightarrow \infty} \frac{\varphi_1}{\theta_1} N + \frac{\varphi_1}{\theta_1} > 1$$

Whether or not an employee becomes a supervisor, depends on other criteria. A sufficient condition is that $mc_{i-1,1} / mb_{i-1,1} < 1$: the benefits of hiring the first subordinate exceed the costs. For the calibrated model, this condition is met for the first three levels of the firm. This implicates that the baseline firm should consist of at least four levels. As discussed in the main text, this is the actual number of levels for the baseline simulation. For the small business, this condition is met for the first level only, and for the large enterprise for the first three levels.

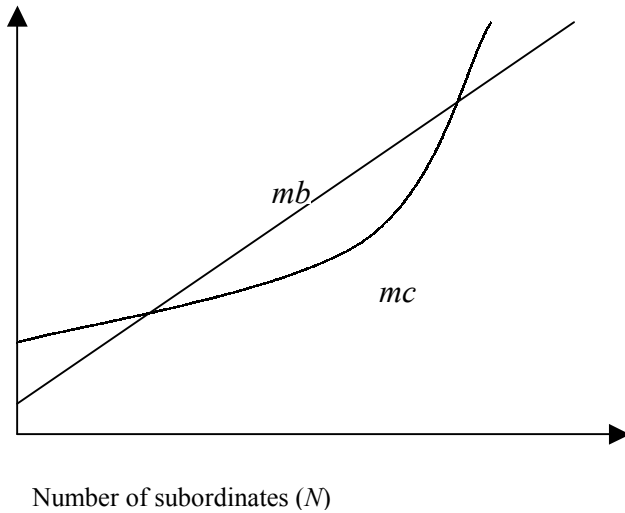
Both the small and the large enterprise have one level more than the minimum implied by the condition $mc_{i-1,1} / mb_{i-1,1} < 1$. Apparently, even if this condition doesn't hold, it may still be profitable to hire several employees. This is because marginal costs are a

convex function of N , and marginal benefits a linear function (see Figure 7.4 for an example). Necessary (but not sufficient) conditions for this solution are:

1. $mc_{i-1,1} > mb_{i-1,1}$, and
2. $\frac{\partial mc_{i-1,N}}{\partial N} < \frac{\partial mb_{i-1,N}}{\partial N}$, for $N=0$.

This second inequality is equivalent with $\varphi_1 / \theta_1 < 1 \Leftrightarrow \alpha/\beta < 2/3$. This condition is met in our calibrated model.

Figure 7.4 Marginal costs and marginal benefits



If the conditions that guarantee a finite number of subordinates are met, then team size is implicitly defined by the following equation:

$$mc_{i-1,N+1} = mb_{i-1,N+1}$$

\Leftrightarrow

$$mc_{i-1,N+1} / q_{j,i} = mb_{i-1,N+1} / q_{j,i}$$

\Leftrightarrow

$$3\alpha \cdot N^2 + 3\alpha \cdot N + \alpha + \frac{\gamma_{fp,1}}{\gamma_{q,1}} \cdot \left(\frac{\gamma_{fp,2}}{\gamma_{q,2}} \right)^i + \frac{\gamma_{w,1}}{\gamma_{q,1}} \cdot \left(\frac{\gamma_{w,2}}{\gamma_{q,2}} \right)^i + \frac{AC}{\gamma_{q,1}} \cdot \left(\frac{1}{\gamma_{q,2}} \right)^i = 2\beta \cdot N + \beta + 1$$

Marginal benefits per unit of production only depend on the benefits of cooperation and the number of incumbent workers, and are independent of the hierarchical level i . In contrast, marginal costs per unit of production differ between hierarchical levels. In our calibrated version of the model, the relative share of the supervision costs increases with the level, while the relative weight of the adjustment and wage costs decreases.

Summary in Dutch

Inleiding

Mensen vormen de motor van elke economie. Op macro-economisch niveau wordt menselijk kapitaal als de belangrijkste motor voor economische groei beschouwt, terwijl het op bedrijfsniveau als belangrijke bron voor concurrentievoordelen geldt. Recente technologische ontwikkelingen op het gebied van informatie- en communicatietechnologieën (ICT) hebben het belang van menselijk kapitaal alleen maar doen toenemen. Door het toenemende belang van de kennis en vaardigheden van werknemers, neemt ook het belang van een goed management van deze werknemers toe. Dit verklaart de toenemende stroom aan publicaties over HRM (Human Resource Management).

Tegelijkertijd is gedurende de afgelopen decennia het aandeel en het belang van het midden- en kleinbedrijf (MKB) in de meeste westerse economieën toegenomen. Dit is gepaard gegaan met een groeiend aantal publicaties over MKB en ondernemerschap.

Ondanks deze combinatie van ontwikkelingen staat onderzoek naar HRM binnen het MKB nog in de kinderschoenen. Onze huidige kennis op dit terrein gaat niet veel verder dan dat kleine bedrijven gemiddeld genomen minder aandacht aan HRM besteden dan grote bedrijven. Dit suggereert dat een toenemend aandeel van het MKB een negatieve invloed zou kunnen hebben op de beschikbare hoeveelheid menselijk kapitaal op macro-economisch niveau, en daarmee zand zou kunnen strooien in de motor van de economische vooruitgang. Op dit moment is onze kennis echter onvoldoende om vast te kunnen stellen of dit een reële bedreiging is. Het doel van dit proefschrift is dan ook om ons inzicht in HRM binnen het MKB te vergroten.

Naast HRM wordt ook vaak de term personeelsbeleid gebruikt. Dat personeelsbeleid niet simpelweg de Nederlandse vertaling van “human resource management” is, blijkt wel uit het feit dat ook in de Engelstalige literatuur een onderscheid gemaakt wordt tussen “personnel management” en “human resource management” (wat geen Nederlandse vertaling heeft). In normatieve zin zijn de verschillen tussen beide begrippen beperkt, maar binnen HRM wordt een (nog) groter belang aan de rol van werknemers toegekend dan binnen personeelsbeleid.

Eerder onderzoek

Onderzoek naar HRM kan in drie categorieën verdeeld worden: het kan zich richten op kenmerken van het gevoerde beleid, op determinanten ervan, of op gevolgen ervan. Onderzoek naar HRM binnen het MKB behoort vooral tot de eerste categorie. Het overgrote deel bestaat uit beschrijvend onderzoek naar kenmerken van het gevoerde beleid. Soms staan hierbij specifieke aspecten van HRM centraal, maar meestal worden meerdere aspecten van HRM in kaart gebracht. Hierbij wordt met name gekeken naar prestatieverhogende HRM maatregelen (high performance HRM practices). Dit zijn maatregelen waarvan gebleken is, dat ze voor grote bedrijven een positieve invloed op diverse prestatie maatstaven (zoals productiviteit en uitstroom) hebben. Voorbeelden van dergelijke maatregelen zijn het testen van sollicitanten, aandacht voor bedrijfsopleidingen en prestatiebeloning. Er bestaat echter nog geen precieze afbakening van het begrip “prestatieverhogende HRM maatregelen”. Ook is het effect van deze maatregelen binnen kleine en middelgrote bedrijven onbekend.

Eerder onderzoek naar HRM binnen het MKB bevestigt het beeld dat kleinere bedrijven in het algemeen minder prestatieverhogende HRM maatregelen toepassen dan grotere bedrijven. Uit deze bevindingen mag echter niet geconcludeerd worden dat de mate waarin dergelijke maatregelen worden toegepast, *verklaard* wordt door het aantal werknemers van een bedrijf. De samenhang tussen bedrijfsgrootte en HRM kan ook verklaard worden door de afhankelijkheid van HRM van andere, met bedrijfsgrootte samenhangende, factoren waar meestal geen rekening mee wordt gehouden.

Het aantal werknemers van een bedrijf is slechts een van de vele dimensies waarlangs bedrijven vergeleken kunnen worden. Er kunnen twee soorten organisationele dimensies onderscheiden worden: contextuele en structurele dimensies. Contextuele dimensies karakteriseren de organisatie als geheel, en hebben betrekking op het aantal werknemers, doelstellingen en strategie, de bedrijfsomgeving, bedrijfscultuur en de gehanteerde technologieën. Structurele dimensies hebben betrekking op interne bedrijfskenmerken, zoals formalisatie, specialisatie, standaardisatie en centralisatie. Veel dimensies zijn onderling aan elkaar gerelateerd. Zo geldt bijvoorbeeld dat kleine bedrijven meestal minder geformaliseerd, gespecialiseerd en gestandaardiseerd zijn dan grote bedrijven. In veel onderzoek ontbreken gegevens over deze dimensies, en wordt het aantal werknemers als controlevariabele gebruikt om hiervoor te corrigeren.

Onderzoeksvragen

Onderzoek naar HRM binnen het MKB draaide tot op heden vooral om het beschrijven van kenmerken van het gevoerde beleid. Dit proefschrift richt zich met name op de twee andere categorieën. Hoofdstukken drie t/m vijf richten zich op determinanten van HRM, en hoofdstukken zes en zeven op gevolgen van HRM. In deze hoofdstukken worden de volgende onderzoeksvragen beantwoord:

- in welke mate wordt het gebruik van prestatieverhogende HRM maatregelen binnen het MKB verklaard door verschillen in organisationele context (hoofdstukken drie en vier)?
- welke factoren verklaren of kleine en middelgrote bedrijven al dan niet preventieve maatregelen nemen om ziekteverzuim te beperken (hoofdstuk vijf)?
- is de invloed van bedrijfsopleidingen verschillend voor kleine en grote bedrijven (hoofdstuk zes)?
- in welke mate kunnen verschillen in de resultaten van HRM een verklaring bieden voor verschillen in bedrijfsgrootte (hoofdstuk zeven)?

De onderzoeksvragen gaan in op mogelijke verbanden tussen bedrijfsgrootte en andere organisationele dimensies, om op deze manier een verklaring te kunnen geven voor geconstateerde verschillen tussen kleinere en grotere bedrijven. Door de keuze van vier onderling onafhankelijke onderzoeksvragen wordt bereikt dat dit proefschrift bij kan dragen aan een verbreding van de huidige kennis over HRM binnen kleine en middelgrote bedrijven. In het vervolg van deze samenvatting zullen deze vier onderzoeksvragen worden uitgewerkt, waarna de belangrijkste antwoorden op deze vragen kort worden samengevat. Deze samenvatting eindigt met enkele slotoverwegingen.

Organisationele context en HRM in kleine bedrijven

De eerste onderzoeksvraag richt zich op de rol van bedrijfsgrootte en andere contextuele dimensies als determinanten van de mate waarin prestatieverhogende HRM maatregelen

worden toegepast. Om deze onderzoeksvraag te beantwoorden zijn twee verschillende onderzoeken uitgevoerd. In het eerste, exploratieve, onderzoek is een theoretisch kader ontwikkeld dat de invloed van verschillende contextuele variabelen op de aandacht voor prestatieverhogende HRM maatregelen weergeeft. Uit interviews met enkele ondernemers uit kleine bedrijven is de potentie van dit theoretisch kader gebleken. In het vervolgonderzoek (waarover straks meer) is dit kader verder onderzocht.

Dit theoretisch kader combineert inzichten uit verschillende theoretische stromingen, waaronder de “resource-based perspective”, de “behavioural perspective”, institutionele economie en transactiekostentheorie. Deze stromingen suggereren verschillende manieren waarop contextuele dimensies (waaronder het aantal werknemers) een drietal intermediaire variabelen beïnvloeden: verwachtingen en eisen van externe belanghebbenden (stakeholders) met betrekking tot het gevoerde HRM, de beschikbaarheid van benodigde middelen (zowel geld als kennis), en het nut dat de ondernemer toekent aan HRM. Deze intermediaire variabelen kunnen vervolgens invloed uitoefenen op de toepassing van prestatieverhogende HRM maatregelen.

In het eerste onderzoek zijn, naast bedrijfsgrootte, de volgende contextuele variabelen opgenomen: de aanwezigheid van een collectieve arbeidsovereenkomst (CAO), de groei oriëntatie (of een bedrijf al dan niet expliciet groei nastreeft), en of een bedrijf geassocieerd is met een ander, groter bedrijf. Een dergelijke associatie kan betrekking hebben op een franchiseorganisatie, een inkooporganisatie, een dealerschap, of een erkend toeleverancierschap voor grote bedrijven.

Een eerste empirische toetsing van dit theoretisch kader is uitgevoerd op basis van semi-structureerde interviews met ondernemers van kleine bedrijven over hun HRM. Het voordeel van dergelijke interviews is dat ze informatie leveren over de specifieke omstandigheden en kenmerken van elk bedrijf. Een belangrijk nadeel is dat vergelijkbare informatie slechts voor een beperkt aantal variabelen beschikbaar is. Voor dit onderzoek is vergelijkbare informatie beschikbaar voor drie specifieke prestatieverhogende HRM maatregelen: het gebruik van schriftelijke taakomschrijvingen, het regelmatig houden van beoordelingsgesprekken, en de aanwezigheid van bedrijfsopleidingen. Informatie over intermediaire variabelen is niet verzameld, zodat de geformuleerde hypothesen een direct verband leggen tussen contextuele variabelen en het gebruik van deze geselecteerde maatregelen.

De resultaten van het onderzoek suggereren dat niet alle contextuele variabelen even belangrijk zijn. Zoals voorspeld, gaat een toenemende bedrijfsgrootte gepaard met een toenemend gebruik van prestatieverhogende HRM maatregelen. Met name neemt de kans op regelmatig gehouden beoordelingsgesprekken en op bedrijfsopleidingen toe. Ook het al dan niet geassocieerd zijn met een groter bedrijf is van invloed, zij het alleen op de aanwezigheid van bedrijfsopleidingen. Bedrijven met een duidelijke groei oriëntatie lijken vaker bedrijfsopleidingen aan te bieden en regelmatig beoordelingsgesprekken te houden, maar dit verband is niet al te sterk. Of bedrijven al dan niet onder een CAO vallen lijkt niet van invloed te zijn op de in dit onderzoek betrokken voorbeelden van prestatieverhogende HRM maatregelen.

Prestatieverhogende HRM maatregelen in het MKB

Om dit theoretisch kader verder te onderzoeken, is een tweede onderzoek uitgevoerd. Het kader is hierbij op enkele punten uitgebreid. Zo kunnen de intermediaire variabelen

niet alleen een directe invloed hebben op de toepassing van prestatieverhogende HRM maatregelen, maar ook indirect, via de aanwezigheid van een afdeling en/of medewerker die zich specifiek met HRM bezighoudt (zeg maar, de HRM-afdeling). De intermediaire variabelen kunnen de kans verhogen dat een HRM-afdeling aanwezig is; de aanwezigheid van een HRM-afdeling wordt vervolgens verondersteld een positieve invloed op de toepassing van prestatieverhogende HRM maatregelen te hebben.

Daarnaast zijn enkele nieuwe contextuele variabelen aan het kader toegevoegd: de aanwezigheid van een ondernemingsplan, of een bedrijf al dan niet exporteert, of een bedrijf is aangesloten bij een franchiseorganisatie, of het eigendom van het bedrijf in handen is van leden van één familie, en de vakbondsgraad (het percentage werknemers dat lid is van een vakbond). Bedrijfsgrootte, de aanwezigheid van een ondernemingsplan, exporteren en het lidmaatschap van een franchiseorganisatie worden allemaal verondersteld een positieve invloed te hebben op de aanwezigheid van een HRM-afdeling en/of op de formaliteit van het gevoerde HRM. Voor familiebedrijven daarentegen wordt verondersteld dat de kans dat een HRM-afdeling aanwezig is lager is, evenals het gebruik van prestatieverhogende HRM maatregelen.

Om deze hypothesen te toetsen, worden de resultaten van een schriftelijke enquête over HRM gebruikt. Deze enquête is voorgelegd aan Nederlandse bedrijven met 20 tot 200 werknemers uit 6 verschillende sectoren, en uiteindelijk door 695 bedrijven beantwoord. De enquête bevat vele vragen over verschillende aspecten van HRM, zoals werving, selectie, scholing, beoordeling en beloning. Voor elk van deze 5 categorieën is een aparte schaal geconstrueerd die de mate weergeeft waarin prestatieverhogende HRM maatregelen worden toegepast. Vervolgens is op basis van deze 5 schalen een extra schaal gedefinieerd die het gemiddelde gebruik van prestatieverhogende HRM maatregelen over alle onderzochte categorieën weergeeft.

De empirische analyse voor dit onderzoek bestaat uit twee delen. In het eerste deel wordt de invloed van de verschillende contextuele variabelen op de aanwezigheid van een HRM-afdeling onderzocht. Volgens de berekeningen komen HRM-afdelingen vooral voor bij grote bedrijven met een schriftelijk ondernemingsplan. Familiebedrijven hebben juist minder vaak een HRM-afdeling dan overige bedrijven (ook na correctie voor de overige contextuele variabelen). Exporteren, het lidmaatschap van een franchiseorganisatie en de vakbondsgraad zijn niet van invloed op de kans dat een bedrijf een HRM-afdeling heeft.

In het tweede deel van de empirische analyses staan prestatieverhogende HRM maatregelen centraal. Voor elk van de gedefinieerde schalen wordt een lineaire regressievergelijking geschat, om te achterhalen welke contextuele variabelen van invloed zijn. Ook wordt hierbij rekening gehouden met de aanwezigheid van een HRM-afdeling. Als alleen naar bedrijfsgrootte wordt gekeken, blijkt wederom dat de mate waarin prestatieverhogende HRM maatregelen worden gebruikt toeneemt met het aantal werknemers. Dit grootteklasse-effect wordt voor ongeveer de helft verklaard door de overige contextuele variabelen in het model. Na correctie voor bedrijfsgrootte blijkt dat bedrijven met een HRM-afdeling meer aandacht aan prestatieverhogende HRM maatregelen besteden dan bedrijven zonder een HRM-afdeling. Familiebedrijven worden gekenmerkt door een relatief beperkt gebruik van prestatieverhogende HRM maatregelen. Bedrijven die exporteren passen met name meer prestatieverhogende maatregelen toe met betrekking tot werving en selectie, en aansluiting bij een franchiseorganisatie stimuleert het gebruik van prestatieverhogende maatregelen op het gebied van bedrijfsopleidingen.

Deze resultaten bevestigen eerder onderzoek volgens welke kleine bedrijven minder prestatieverhogende HRM maatregelen uitvoeren dan grote bedrijven. Een nieuwe bevinding is dat bedrijven die meer aandacht aan strategieontwikkeling lijken te besteden (wat wordt aangegeven door de aanwezigheid van een schriftelijk ondernemingsplan) ook eerder een HRM-afdeling hebben en meer oog hebben voor prestatieverhogende HRM maatregelen. Belangrijker dan de aanwezigheid van een schriftelijk ondernemingsplan is de vraag of er sprake is van een familiebedrijf of niet. De relatieve informaliteit van het HRM van familiebedrijven suggereert dat eigenaren en/of directeuren van familiebedrijven wellicht andere doelstellingen en/of instellingen hebben dan managers van overige bedrijven. Onderzoek naar familiebedrijven wijst uit dat dergelijke verschillen inderdaad bestaan: eigenaren van familiebedrijven hebben een relatief sterke wens om volledige controle over hun bedrijf te houden. Formalisering van HRM lijkt gezien te worden als een bedreiging voor deze controle, wat de lage belangstelling voor prestatieverhogende HRM maatregelen kan verklaren.

Verzuimpreventie

De tweede onderzoeksvraag richt zich op verzuimpreventie. De aanwezigheid van werknemers, en dus ook het verzuim, hangt zowel af van de mogelijkheid om aanwezig te zijn, als van hun motivatie om aanwezig te zijn. Onderzoek naar (ziekte)verzuim vindt zowel vanuit een psychologische als vanuit een economische invalshoek plaats, en in beide gevallen gaat de meeste aandacht uit naar de motivatie van werknemers om aanwezig te zijn. Vooral binnen de economische literatuur wordt (ziekte)verzuim vaak gezien als een bewuste keuze van werknemers die niet tevreden zijn met het contractueel afgesproken aantal te werken uren. In hun pogingen om het verzuim zo laag mogelijk te houden, kunnen bedrijven zich echter ook richten op de mogelijkheid van werknemers om aanwezig te zijn; dat wil zeggen, hun gezondheidssituatie. De gezondheidssituatie hangt onder andere af van de werkomstandigheden binnen bedrijven. Preventief arbobeleid, gericht op het verbeteren van de werkomstandigheden, kan een positieve invloed hebben op de mogelijkheid om aanwezig te zijn, en langs deze weg het ziekteverzuim doen dalen.

Gezien de verschillen in ziekteverzuim tussen kleine en grote bedrijven, lijkt deze invalshoek met name voor kleine en middelgrote bedrijven van belang. Kleine bedrijven hebben gemiddeld genomen een lager ziekteverzuim dan grote bedrijven, maar tegelijkertijd is de kans op een bedrijfsongeval hoger voor deze groep bedrijven. Dit suggereert dat de motivatie van werknemers, als verklarende factor voor het ziekteverzuim, voor grotere bedrijven een belangrijkere rol speelt dan voor kleinere bedrijven. Het onderzoek naar verzuimpreventie binnen het MKB richt zich daarom op preventief arbobeleid, en met name op determinanten voor de keuze om al dan niet de werkomstandigheden te verbeteren.

Als uitgangspunt wordt verondersteld, dat bedrijven werkomstandigheden zullen verbeteren als de verwachte opbrengsten hiervan hoger zijn dan de verwachte kosten. De verwachte opbrengsten hangen af van het verwachte effect van de verbeterde werkomstandigheden op het ziekteverzuim. Het lijkt aannemelijk dat de verwachtingen die een ondernemer heeft over het effect van dergelijke maatregelen afhangen van de door die ondernemer veronderstelde samenhang tussen werkomstandigheden en ziekteverzuim binnen een bedrijf. De belangrijkste hypothese voor dit onderzoek is dan ook, dat bedrijven die veronderstellen dat er een samenhang bestaat tussen werkomstandigheden en ziekteverzuim, eerder geneigd zijn werkomstandigheden binnen hun bedrijf te verbeteren.

ren. Andere hypothesen gaan nader in op deze veronderstelling: welke factoren bepalen of een bedrijf daadwerkelijk een dergelijke samenhang veronderstelt?

Om deze hypothesen te testen, wordt gebruik gemaakt van de resultaten van een telefonische enquête. Voor deze enquête zijn Nederlandse bedrijven met maximaal 200 werknemers uit 6 verschillende sectoren gebeld; resultaten zijn beschikbaar voor 579 bedrijven. Volgens deze resultaten heeft 37% van het Nederlandse MKB ten tijde van de enquête preventieve maatregelen genomen om de werkomstandigheden te verbeteren. Tegelijkertijd veronderstelt slechts 18% een samenhang tussen werkomstandigheden en ziekteverzuim in het bedrijf. Hieruit blijkt dat het veronderstellen van samenhang geen noodzakelijke voorwaarde is voor het verbeteren van de werkomstandigheden. Een mogelijke verklaring hiervoor is de verplichte status van verschillende maatregelen (zoals het dragen van helmen op bouwterreinen). Een andere mogelijkheid is dat respondenten van mening zijn dat er tegenwoordig geen samenhang tussen werkomstandigheden en ziekteverzuim meer bestaat, als gevolg van verbeteringen van de werkomstandigheden in het verleden.

Dit resultaat neemt niet weg, dat het veronderstellen van samenhang een positieve invloed kan hebben op de beslissing om preventieve maatregelen te nemen. Verder onderzoek toont aan dat bedrijven die een hogere inschatting maken van de (zwaarte van de) geestelijke en/of lichamelijke werkomstandigheden binnen hun bedrijf, eerder een samenhang veronderstellen tussen werkomstandigheden en ziekteverzuim. Een dergelijke samenhang wordt ook eerder onderkend als er lichamelijke of geestelijke klachten worden geuit of als het ziekteverzuim hoger ligt. Na correctie voor deze factoren wordt ook een grootteklasse-effect gevonden: grote bedrijven veronderstellen eerder een dergelijke samenhang dan kleine bedrijven.

De belangrijkste hypothese van dit onderzoek wordt echter verworpen: bedrijven die een samenhang veronderstellen tussen werkomstandigheden en ziekteverzuim zijn niet eerder geneigd om (hierdoor) preventieve maatregelen te nemen. De kans dat werkomstandigheden verbeterd worden, neemt met name toe als de lichamelijke belasting voor werknemers groter lijkt te zijn en als een Risico Inventarisatie en Evaluatie heeft plaatsgevonden⁸². Ten slotte blijkt dat de kans dat preventieve maatregelen genomen worden toeneemt met de bedrijfsgrootte.

De uitkomsten van dit onderzoek suggereren dat, in ieder geval ten tijde van de telefonische enquête (1995), de meeste kleine bedrijven geen bewust beleid hebben om het ziekteverzuim terug te dringen door de werkomstandigheden te verbeteren. Dit kan het gevolg zijn van het relatief lage ziekteverzuim bij de meeste kleine bedrijven, maar kan ook samenhangen met de beperkte tijd en kennis van ondernemers op dit terrein. Grote bedrijven besteden meer aandacht aan het verbeteren van werkomstandigheden, ook als rekening gehouden wordt met verschillen in ziekteverzuim en het al dan niet veronderstellen van een samenhang tussen werkomstandigheden en ziekteverzuim. Wellicht komt dit, omdat (het verzuimbeleid van) grote bedrijven meer in de publieke belangstelling staan dan kleine bedrijven. Maar ook verschillen in wetgeving en in beschikbare tijd, kennis en ervaring van betrokken managers kunnen een rol spelen.

⁸² Ten tijde van het onderzoek was een Risico Inventarisatie en Evaluatie reeds wettelijk verplicht, maar waren veel bedrijven nog niet van deze verplichting op de hoogte.

De opbrengsten van bedrijfsopleidingen

Het is een bekend feit dat de aandacht voor bedrijfsopleidingen toeneemt met de bedrijfsgrootte. Over de relatie tussen bedrijfsgrootte en de opbrengsten van bedrijfsopleidingen is echter maar weinig bekend. De derde onderzoeksvraag richt zich op het onderzoeken van deze relatie.

Bedrijfsopleidingen kunnen twee tegengestelde effecten op de productie (of toegevoegde waarde) van bedrijven hebben. Enerzijds worden bedrijfsopleidingen geacht de productiviteit van individuele werknemers te verhogen, en zodoende de productiviteit op bedrijfsniveau. Werknemers die (onder werktijd) een opleiding volgen, kunnen op dat moment echter niet werken: bedrijfsopleidingen gaan gepaard met een verlies aan productieve uren. De meeste empirische onderzoeken naar het effect van bedrijfsopleidingen op bedrijfsprestaties kunnen deze twee effecten niet van elkaar onderscheiden. Dit komt omdat er meestal geen informatie beschikbaar is over de tijd die met bedrijfsopleidingen gemoeid is. Voor dit onderzoek zijn dergelijke gegevens wel beschikbaar, waardoor het mogelijk is het positieve effect van bedrijfsopleidingen op productiviteit te scheiden van het negatieve effect op het aantal productieve uren.

Er zijn verschillende argumenten volgens welke een grootteklasse-effect zou kunnen bestaan. Deze argumenten hangen samen met de organisatie van bedrijfsopleidingen: hoeveel en welke bedrijfsopleidingen worden gegeven, welke werknemers volgen deze opleidingen, en hoe worden deze werknemers begeleid? In dit onderzoek wordt nader ingegaan op drie mogelijke effecten van bedrijfsgrootte op de invloed van bedrijfsopleidingen: het selectie-effect, het HRM-effect en het schaaffect. Het selectie-effect gaat uit van afnemende meeropbrengsten: naarmate er reeds meer bedrijfsopleidingen worden aangeboden, nemen de opbrengsten van nieuwe bedrijfsopleidingen af. Dit selectie-effect resulteert in een indirect grootteklasse-effect: omdat grote bedrijven gemiddeld genomen meer bedrijfsopleidingen verzorgen dan kleine bedrijven, hangen de gemiddelde opbrengsten van bedrijfsopleidingen negatief samen met bedrijfsgrootte.

Ook het HRM-effect is een indirect grootteklasse-effect. Het HRM-effect stelt dat de opbrengsten van bedrijfsopleidingen beïnvloed worden door de trainingsbegeleiding, gedefinieerd als de tijd die bedrijven besteden aan het managen en coördineren van bedrijfsopleidingen. Trainingsbegeleiding vormt een investering in de kwaliteit van het opleidingsbeleid: meer trainingsbegeleiding verhoogt de opbrengsten van bedrijfsopleidingen. Als kleine bedrijven minder in trainingsbegeleiding investeren dan grote bedrijven, zullen de opbrengsten van die opleidingen hierdoor lager uitvallen voor kleinere bedrijven.

Het derde effect is het schaaffect. Volgens dit (directe) grootteklasse-effect kunnen grote bedrijven van schaalvoordelen profiteren: naarmate meerdere werknemers bepaalde opleidingen volgen, wordt het makkelijker om deze opleidingen af te stemmen op de specifieke wensen en behoeften van het desbetreffende bedrijf. Door een betere afstemming van vorm en inhoud van een cursus op de wensen van een bedrijf zullen de opbrengsten van die opleiding toenemen.

Om vast te stellen of er empirische ondersteuning is voor deze drie effecten, zijn berekeningen uitgevoerd op basis van een panel met gegevens over 173 Nederlandse bedrijven voor de jaren 1990 en 1993. Deze bedrijven zijn in drie grootteklassen ingedeeld: 40-150 werknemers, 150-500 werknemers en 500 of meer werknemers. Specifieke pa-

neldata schattingsmethoden (de zogenaamde fixed effects en random effects schatters) zijn gebruikt om een productiefunctie te schatten, waarbij het aantal trainingdagen als een aparte productiefactor wordt gezien.

De schattingsresultaten vinden alleen ondersteuning voor het HRM-effect. De opbrengsten van bedrijfsopleidingen zijn hierdoor gemiddeld genomen voor kleinere bedrijven lager dan voor grotere bedrijven. Voor bedrijven die niet of nauwelijks aan trainingsbegeleiding doen, hebben bedrijfsopleidingen zelfs geen enkel positief effect op bedrijfsprestaties. Deze opbrengsten van bedrijfsopleidingen kunnen vergeleken worden met het negatieve effect dat optreedt door het verlies aan productieve uren. Hiertoe zijn enkele voorzichtige berekeningen uitgevoerd om een eerste indicatie te krijgen van het break-even punt, waar het (eenmalige) verlies aan productieve uren juist tenietgedaan wordt door de (structureel) gestegen productiviteit. Voor bedrijven met 500 of meer werknemers zou dit break-even punt tussen 3 en 4 jaar liggen, maar voor bedrijven met minder dan 150 werknemers zou dit punt pas na meer dan 20 jaar optreden. Deze berekeningen zijn echter met te veel onzekerheden omgeven, om hier harde conclusies uit te kunnen trekken over winstgevendheid en wenselijkheid van investeringen in bedrijfsopleidingen.

De invloed van transactiekosten en menselijk kapitaal op bedrijfsgrootte

In de voorafgaande drie onderzoeksvragen heeft bedrijfsgrootte de rol van exogene variabele gespeeld, en is de relatie onderzocht tussen het aantal werknemers, kenmerken van HRM en de effectiviteit van (een specifiek onderdeel van) HRM. Een effectief HRM wordt verondersteld de instroom van personeel te bevorderen, de doorstroom te optimaliseren, en de uitstroom te beperken. Langs deze weg is HRM uiteindelijk van invloed op bedrijfsprestaties, waaronder continuïteit, marktaandeel, winst en groei. Dit laatste suggereert dat het aantal werknemers van een bedrijf niet alleen een mogelijke determinant is van HRM, maar ook mede het gevolg kan zijn van de effectiviteit van het gevoerde HRM. Deze mogelijke relatie staat centraal in de laatste onderzoeksvraag.

Er bestaan verschillende theorieën om bestaande verschillen in bedrijfsgrootte te verklaren. Verschillen in productietechnieken hangen samen met verschillende schaalvoordelen, waarmee verschillen in optimale bedrijfsgrootte tussen sectoren en landen verklaard kunnen worden. De transactiekostentheorie wordt gebruikt om de (transactie)kosten van interne organisaties te onderzoeken. Verschillende verhoudingen tussen interne en externe transactiekosten kunnen volgens deze theorie leiden tot verschillen in optimale bedrijfsomvang. Deze benadering is bij uitstek geschikt om verschillen in bedrijfsgrootte te verklaren tussen bedrijven die in vergelijkbare omgevingen opereren, zeker als hierbij rekening gehouden wordt met het feit dat individuele werknemers over verschillende kennis en vaardigheden beschikken.

Voor de laatste onderzoeksvraag wordt onderzocht wat het relatieve belang van elk van deze factoren is als verklarende factor voor verschillen in bedrijfsgrootte. Hiertoe wordt gebruik gemaakt van een simulatiemodel. Dit model geeft het besluitvormingsproces weer van een winstmaximaliserende ondernemer, over het aantal werknemers dat hij in dienst wil nemen. Deze beslissing hangt af van de kosten en opbrengsten van het werven, selecteren, inzetten en monitoren van werknemers, en van de kosten en opbrengsten van samenwerking tussen werknemers. Werknemers beschikken in dit model over individuele kwaliteiten. De kwaliteit van elke nieuwe werknemer is gemodelleerd als een stochastisch proces; hetzelfde geldt voor de uitstroomkansen van zittende werkne-

mers. Door deze stochastiek geldt dat als bij gegeven parameterwaarden meerdere simulaties uitgevoerd worden, de uitkomsten van deze simulaties kunnen verschillen. Om hiermee rekening te houden worden alle modelsimulaties (voor een specifieke keuze van parameterwaarden) 100 keer uitgevoerd.

De parameters van dit model zijn zo gekalibreerd, dat de modelsimulaties een representatief bedrijf genereren met meerdere hiërarchische lagen. De arbeidsstromen binnen dit representatieve bedrijf (instroom, interne promoties, en uitstroom) komen overeen met resultaten van empirisch onderzoek.

In eerste instantie wordt dit model gebruikt om na te gaan in welke mate overlevingskansen en bedrijfsgrootte van dit representatieve bedrijf bepaald worden door de gemiddelde arbeidsproductiviteit en specialisatie. De uitkomsten van deze simulaties worden gebruikt om een representatief klein bedrijf (met gemiddeld 25 werknemers, verdeeld over drie hiërarchische lagen) en een representatief groot bedrijf (met gemiddeld 790 werknemers, verdeeld over vijf hiërarchische lagen) te definiëren. Vervolgens worden voor deze twee representatieve bedrijven diverse simulaties uitgevoerd, om na te gaan hoe de bedrijfskenmerken afhangen van alle modelparameters (en daarmee van de kosten en opbrengsten van het werven, selecteren, inzetten en monitoren van werknemers, en de kosten en opbrengsten van samenwerking tussen werknemers).

De modelsimulaties identificeren twee verschillende oorzaken die kunnen verklaren waarom winstmaximaliserende bedrijven die in vergelijkbare omgevingen opereren van omvang kunnen verschillen. De eerste oorzaak is dat de kosten van interne transacties tussen bedrijven kunnen variëren. Dit effect is reeds eerder beschreven, maar totnogtoe zijn hierbij geen schaafeffecten onderscheiden. De modelsimulaties tonen aan dat schaafeffecten kunnen optreden: de omvang van het representatieve kleine bedrijf reageert minder sterk op veranderingen in interne transactiekosten dan de omvang van het representatieve grote bedrijf.

De tweede oorzaak is heterogeniteit in het aanbod van arbeid, en de manier waarop bedrijven hiermee omgaan. Het belang van deze heterogeniteit kan bepaald worden, door te kijken naar de spreiding in de resultaten van modelsimulaties bij gegeven parameterwaarden. Immers, als alle parameterwaarden gelijk gehouden worden, dan kunnen verschillen in stand- en stroomcijfers tussen individuele modelsimulaties alleen verklaard worden door de variaties in de kwaliteiten en kwalificaties van individuele werknemers (aangezien dit het enige onderdeel van het simulatiemodel is dat aan stochastiek onderhevig is).

Deze variaties kunnen gezien worden als maatstaf voor de effectiviteit van het gevoerde HRM in de verschillende bedrijven; een relatief hoge instroom duidt op een relatief effectief wervings- en selectiebeleid, en een relatief lage uitstroom duidt op bedrijven die hun medewerkers goed aan het bedrijf kunnen binden. Het model is niet in staat om vast te stellen hoe het optimale HRM eruitziet, maar kan wel vaststellen in welke mate verschillen in de effectiviteit van HRM doorwerken in interne arbeidsstromen, en uiteindelijk bedrijfsomvang.

Ook dit effect pakt verschillend uit voor kleine en grote bedrijven. Voor het simulatiemodel geldt dat de relatieve invloed van de specifieke individuele capaciteiten van medewerkers op bedrijfsgrootte afhangt van de verhouding tussen de transactiekosten en de loonkosten. Dit komt door de veronderstelling van marginale productiviteitslonen,

waardoor de loonkosten per eenheid product onafhankelijk zijn van de productiviteit van individuele medewerkers. Transactiekosten per eenheid product, daarentegen, nemen af als individuele medewerkers over meer kwaliteiten beschikken. Het gesimuleerde representatieve kleine bedrijf heeft relatief weinig hiërarchische lagen, waardoor interne transactiekosten geen grote rol spelen. Het relatieve belang van transactiekosten (t.o.v. loonkosten) neemt toe, naarmate een bedrijf meerdere hiërarchische lagen telt en de interne bureaucratie toeneemt. Het resultaat hiervan is dat de invloed van de specifieke kwaliteiten en vaardigheden van individuele medewerkers op bedrijfsomvang groter is voor grote bedrijven dan voor kleine bedrijven. Bij kleine bedrijven heeft het HRM weinig tot geen invloed op de bedrijfsgrootte, maar wel op de overlevingskans.

Conclusies

In dit proefschrift zijn vier verschillende onderzoeksvragen onderzocht, om op deze manier ons inzicht in determinanten en gevolgen van HRM binnen het midden- en kleinbedrijf te vergroten. In het laatste deel van deze samenvatting worden de belangrijkste antwoorden op deze onderzoeksvragen nogmaals samengevat.

In welke mate wordt het gebruik van prestatieverhogende HRM maatregelen binnen het MKB verklaard door verschillen in organisationele context? Een belangrijke contextuele variabele is de grootte van een bedrijf: het gebruik van prestatieverhogende HRM maatregelen neemt toe naarmate bedrijven groter worden. Deze samenhang tussen bedrijfsomvang en HRM wordt vaak gezien als een indicator voor het belang van (niet gemeten) structurele dimensies, zoals centralisatie, standaardisatie en specialisatie. Ons onderzoek wijst echter uit dat het gevonden grootteklasse-effect voor ruwweg de helft verklaard kan worden door overige contextuele dimensies. Als er rekening gehouden wordt met deze dimensies, dan wordt de relevantie van bedrijfsomvang substantieel kleiner, en zelfs insignificant als het gaat om de beoordeling en beloning. Familiebedrijven en bedrijven zonder een ondernemingsplan blijken minder aandacht te besteden aan prestatieverhogende HRM maatregelen. Deze bedrijven hebben ook minder vaak een specifieke personeelsfunctionaris of HRM-afdeling. De aanwezigheid van een dergelijke functionaris of afdeling heeft een positieve invloed op de toepassing van prestatieverhogende HRM maatregelen. Familie-eigendom, de aanwezigheid van een ondernemingsplan en het aantal werknemers hebben zodoende zowel een directe als een indirecte invloed op het gebruik van prestatieverhogende HRM maatregelen.

De tweede onderzoeksvraag luidt, welke factoren verklaren of MKB-bedrijven al dan niet preventieve maatregelen nemen om ziekteverzuim te beperken. De resultaten van ons onderzoek wijzen uit dat de kans op preventieve maatregelen toeneemt als de lichamelijke belasting voor werknemers (in de ogen van de werkgever) groter lijkt te zijn, als een Risico Inventarisatie en Evaluatie heeft plaatsgevonden, en als er meer werknemers in dienst zijn: de kans dat preventieve maatregelen genomen worden neemt toe met de bedrijfsgrootte. Deze kans is onafhankelijk van het actuele ziekteverzuim en van de veronderstelde geestelijke werkdruk. Ten slotte geldt dat de kans op preventieve maatregelen ook los staat van de mening van werkgevers of er een samenhang bestaat tussen werkomstandigheden en ziekteverzuim binnen hun bedrijf.

De derde onderzoeksvraag richt zich op de opbrengsten van bedrijfsopleidingen. Zijn deze opbrengsten verschillend voor kleine en grote bedrijven? Onze resultaten suggereren dat dit inderdaad het geval is. Voor zowel kleine als grote bedrijven geldt dat bedrijfsopleidingen de productiviteit van werknemers verhogen. De omvang van dit effect

hangt af van de mate van trainingsbegeleiding: naarmate bedrijven meer tijd investeren in het managen en coördineren van bedrijfsopleidingen, nemen de opbrengsten van een extra trainingsdag toe. Gemiddeld genomen besteden kleine bedrijven minder aandacht aan trainingsbegeleiding van hun werknemers dan grote bedrijven. Hierdoor zijn ook de opbrengsten van bedrijfsopleidingen voor kleine bedrijven in het algemeen lager dan voor grote bedrijven.

Kan bedrijfsgrootte niet alleen bepalend zijn voor het gevoerde HRM, maar er ook van afhangen? Dit is de kern van de laatste onderzoeksvraag. Exercities met een simulatiemodel wijzen uit dat dit inderdaad het geval kan zijn. Een belangrijk kenmerk van dit model is de heterogeniteit van het aanbod van arbeid, en van de ontwikkeling van individuele medewerkers binnen bedrijven. Verschillen in niveau en groeivoet van de kwaliteiten van medewerkers kunnen geïnterpreteerd worden als verschillen in de effectiviteit van het gevoerde (maar niet expliciet gemodelleerde) HRM. Met behulp van dit model kan onderzocht worden in welke mate verschillen in de effectiviteit van het gevoerde HRM doorwerken in de instroom, doorstroom, ontwikkeling en uitstroom van personeel, en uiteindelijk in de bedrijfsomvang.

Modelsimulaties wijzen uit dat verschillen in de effectiviteit van HRM inderdaad van invloed kunnen zijn op bedrijfsomvang. Deze invloed wordt met name gevonden bij grote bedrijven met meerdere hiërarchische lagen. Bij kleine bedrijven heeft het HRM weinig tot geen invloed op de bedrijfsgrootte, maar wel op de overlevingskans. Voor de gesimuleerde bedrijven geldt dan ook dat de invloed van de heterogeniteit (en van de effectiviteit van het gevoerde HRM) voor grote bedrijven anders is dan voor kleine bedrijven.

Tot slot

Voor ieder bedrijf met werknemers in dienst is het aansturen van deze werknemers een fundamenteel onderdeel van de bedrijfsvoering, ongeacht of het nu een klein of groot bedrijf is. Werknemers moeten geworven en ingezet worden, en wel op een efficiënte manier. Dit is niet alleen een uitdaging voor grote bedrijven, maar net zozeer voor kleine bedrijven. Zo geeft bijvoorbeeld meer dan 20% van alle Europese bedrijven met 1-9 werknemers in dienst te kennen, dat het werven van personeel met gewenste kwalificaties het belangrijkste probleem is geweest waarmee ze gedurende eind jaren negentig geconfronteerd werden. Voor de categorie van Europese bedrijven met 10-49 werknemers in dienst geldt dit zelfs voor 30%.

Van onderzoek naar HRM onder grote bedrijven weten we dat een toenemend gebruik van prestatieverhogende HRM maatregelen in het algemeen samengaat met betere bedrijfsprestaties. Dergelijk onderzoek heeft nog niet onder kleine bedrijven plaatsgevonden, maar de resultaten van het simulatiemodel suggereren dat HRM ook voor kleine bedrijven van belang kan zijn: zoals onderzoekers al eerder hebben gesuggereerd, kan het gevoerde HRM bepalend zijn voor de overlevingskansen van kleine bedrijven. Aangezien het simulatiemodel geen expliciet gemodelleerde HRM maatregelen bevat, kunnen we geen uitspraken doen over hoe een optimaal HRM eruit zou moeten zien, of in welke mate hierbij prestatieverhogende HRM maatregelen ingeschakeld moeten worden. Het is denkbaar dat voor kleine bedrijven een relatief informele benadering van HRM effectiever is dan een meer formele aanpak, gezien de informele wijze waarop veel kleine bedrijven geleid worden. Dit kan erop duiden dat voor kleine bedrijven het

gebruik van prestatieverhogende HRM maatregelen een minder sterke invloed op bedrijfsprestaties heeft dan voor grote bedrijven.

Dit lijkt echter niet op te gaan voor bedrijfsopleidingen. Althans, niet volgens de resultaten van ons onderzoek naar de opbrengsten van bedrijfsopleidingen. Deze resultaten suggereren dat voor zover het bedrijfsopleidingen betreft, ook kleine en middelgrote bedrijven zouden profiteren van een meer formele organisatie van bedrijfsopleidingen. Tenminste, voor zover deze formele organisatie samenhangt met een behoorlijke mate van trainingsbegeleiding. Bedrijfsopleidingen kunnen de prestatie van kleine en middelgrote bedrijven verbeteren, als er tenminste voldoende aandacht aan trainingsbegeleiding wordt besteed. Veel kleine en middelgrote bedrijven met een beperkt budget voor bedrijfsopleidingen zouden er goed aan doen om een groter deel van dit budget voor trainingsbegeleiding te reserveren, en een kleiner deel daadwerkelijk aan trainingen te besteden. Casestudies onder kleine Britse bedrijven die het Investors in People programma volgen, bevestigen dat ook kleine bedrijven profiteren van een meer formele aanpak van bedrijfsopleidingen.

De antwoorden op de derde en de vierde onderzoeksvraag suggereren dus dat HRM wel degelijk van invloed kan zijn op prestaties van kleine en middelgrote bedrijven. Dit komt overeen met de resultaten van eerder onderzoek. Deze onderzoeken kunnen gezien worden als de eerste studies naar de invloed van HRM op bedrijfsprestaties van bedrijven uit het MKB. Gezien de relevantie van HRM, is het belangrijk om te weten hoe bedrijven tot hun keuzen voor specifieke HRM maatregelen komen. Welke verbanden bestaan er tussen contextuele en structurele dimensies en de specifieke uitwerking van HRM in het MKB?

Er is al vaker vastgesteld dat het HRM van kleine bedrijven minder uitgewerkt is dan dat bij grote bedrijven. Met de eerste onderzoeksvraag is nagegaan, in welke mate het verschil in gebruik van prestatieverhogende HRM maatregelen verklaard kan worden door verschillen in contextuele dimensies. Volgens de resultaten kan ongeveer de helft van dit grootteklasse-effect verklaard worden door enkele contextuele variabelen. Met name de eigendomsverhoudingen blijken een belangrijke rol spelen. Bedrijven waarvan leiding en eigendom grotendeels in handen zijn van één familie worden gekenmerkt door een relatief informeel HRM, waarbij relatief weinig aandacht bestaat voor prestatieverhogende HRM maatregelen. Daarnaast geldt dat veel afhangt van de vraag of een bedrijf een specifieke personeelsfunctionaris of -afdeling heeft.

Er blijkt binnen bedrijven een behoorlijk verschil te bestaan in het gebruik van prestatieverhogende HRM maatregelen op verschillende gebieden van HRM (zoals werving, selectie, beoordeling, beloning en scholing). De correlaties tussen de schalen die in hoofdstuk 4 zijn besproken, lopen uiteen van 0.33 tot 0.52. Deze verschillen illustreren het belang van onderzoek naar specifieke gebieden van HRM, waartoe ook de hoofdstukken over verzuimpreventie en bedrijfsopleidingen in dit proefschrift gerekend kunnen worden.

We moeten nog steeds veel leren over hoe (en waarom) bedrijven daadwerkelijk hun personeel aansturen, en hoe ze hierin verbeteringen kunnen aanbrengen. In dit proefschrift hebben we ons specifiek gericht op overeenkomsten en verschillen tussen kleine en grote bedrijven, en tussen kleine bedrijven onderling. Het aantal werknemers op zich kan vaak geen verklaring bieden voor de geconstateerde verschillen; in veel onderzoeken wordt het gebruikt als controlevariabele om te corrigeren voor de invloed van ande-

re contextuele en/of structurele variabelen waarvan de gegevens ontbreken. In dit proefschrift hebben we hierin verandering gebracht, door grootteklasseverschillen te verklaren op basis van verschillen in andere dimensies dan alleen bedrijfsgrootte.

Dit neemt echter niet weg, dat in een aantal gevallen het aantal werknemers wel degelijk verschillen tussen kleine en grote bedrijven kan verklaren. Vooral voor kleine bedrijven, waar wervings- en selectiebeslissingen maar één of twee keer per jaar (of zelfs minder) genomen hoeven te worden, en waar uitstroom erg beperkt is, geldt dat er weinig ruimte is om specifieke kennis en ervaring over HRM op te bouwen. HRM zal bij deze bedrijven in sterke mate bepaald worden door de sociale vaardigheden van de ondernemer, en minder door de toepassing van specifieke HRM maatregelen. Onderzoek naar HRM valt dan vrijwel samen met onderzoek naar ondernemerschap en leiderschapsstijlen.

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